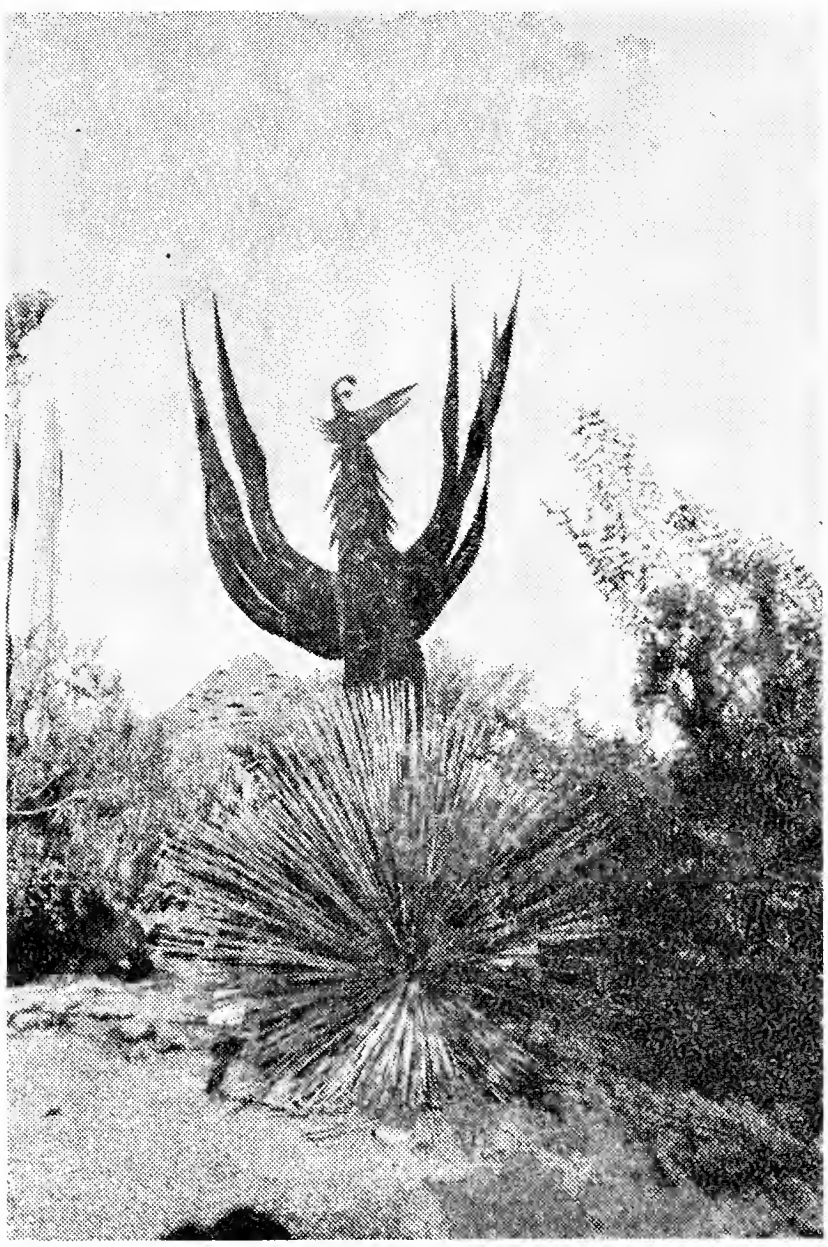
SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

Volume XXIX January, 1975 No. 1



REG MANNING

SAGUAROLAND BULLETIN

Published and owned by the Arizona Cactus and Native Flora Society, sponsors of the Desert Botanical Garden of Arizona, P.O. Box 5415, Phoenix 85010. Saguaroland Bulletin attempts to promote the Garden and to provide information to the desert plants and their culture. Subscription $5.00 per year, the subscription including active membership in the Society and the Desert Botanical Garden. Issued 10 times a year.

W. HUBERT EARLE, Editor
LILLIAN DIVEN, Associate Editor

Volume XXIX | January, 1975 | No. 1

Arizona Cactus and Native Flora Society

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Cover: The Gift of a Phoenix (see p. 10)

Desert Botanical Garden of Arizona

STAFF

Director ..... W. H. Earle
Research Botanist ..... Dr. Howard S. Gentry
Superintendent ..... Rodney G. Engard
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Maintenance & Bookstore ..... Donald C. Shelstad
Student Horticulturist ..... John Moresco

Garden Open Daily 9 A.M.-5 P.M. Including Holidays

Editor's Notes

The arrival of a new year causes the Garden staff to reflect on the past year and plan for next year.

Your Editor and Director conducted many classes, lectures and class field trips during the past year. Attended and participated in the AABGA convention at Mansfield, Ohio in July, after which he visited many botanical gardens and nature centers in the middle West.

Took a staff member and the president of the Central Arizona C&S to a week-long meeting of the International Organization for Succulent Plant Research in Santa Barbara, California.

Attended several quarterly meetings of the Cactus & Succulent Society of America, of which he is a Board Member, at Arcadia, California.

Worked with the City of Phoenix Parks and Recreation Department which installed a model bicycle trail along the east side of the Garden. This is part of an eleven-mile Papago Loop Bike Trail.

Supervised laying of half-mile of three-inch transite water pipe. Realigned service road and levelled a 60-car parking lot at the rear of the Administration Building.

Drew up plans for enhancing the entrance to the Garden off Galvin Parkway with imposing wrought-iron gates and fences, to be a memorial to Charles Mieg, designed and constructed raised beds for either side of the gates, and landscaped the entrance area.

Dr. Howard Gentry, our Research Botanist, continues work on Agaves with funds from the National Science Foundation. We hope to have the Grant extended two years beyond the September, 1975 culmination date. Dr. Gentry, also a force in Jojoba research, has attended several meetings of the group doing active work in this field. He has chaired the Economic Research meeting at the University of Michigan. In connection with his Agave project, he has made several collecting trips to Mexico.

Rodney Engard, now Superintendent, with Doug Hughes, Mark Satterthwaite and John Moresco as his workers, is growing new plants to introduce to the Arizona rare-plant growers. New sections of the Garden have been laid out for plants from other arid areas of the world. Rodney is also responsible for an extensive seed list of our Arizona plants which is internationally well accepted. He also conducts our monthly nature trips to various desert locations.

Harry Lehr, curator of the Herbarium, has added many sheets to our collection. His informative "annual report" will be found on page 10 of this issue.

Lynn Trainum fills in in nearly every job at the Garden. He is in charge of the Visitors' Center for several days of the week and makes monthly out-of-town trips to pick up merchandise for our shop.

Don and Anne Shelstad are at the shop five days a week and handle our voluminous mail. Besides, Don's skill at carpentry is most useful to the Garden.

In early 1975 two events will stand out, the dedication of our handsome new gates and the Cactus Show. An excellent start for what we hope will be a fine new year for all.

Arizona Cactus

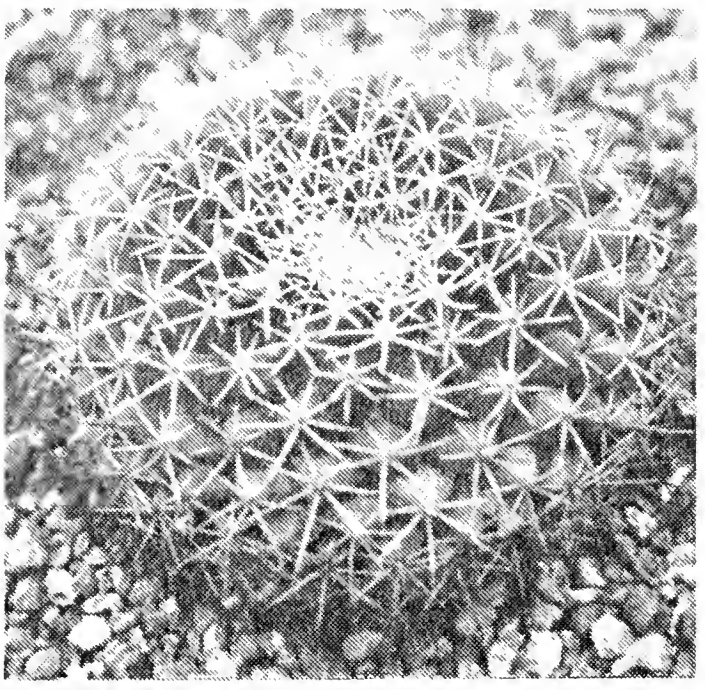
PANCAKE PINCUSHION
Mammillaria gummifera var. applanata
Cactaceae

Seniority counts in the world of botany as much as it does in the world of business. The oldest specific name must be retained in some way even if a plant is transferred to a new genus. Usually the seniority is pretty clear — if Dr. A described a plant in 1800 and Dr. B described it in 1809, obviously Dr. A's name is the older one.

But in the case of the Pancake Pincushion, the seniority was just about as slight as it could be.

When Lyman Benson in 1969 concluded that this small cactus was not a separate species but simply a variety of **Mammillaria gummifera**, he had, because of the rules of botanical nomenclature, to give it a varietal name that was only two days older than its rival.

Mammillaria gummifera was described by Engelmann in his botanical appendix to Wislizenius' "Memoir of a Tour to Northern Mexico" from a type collected at Cosiquiriachi, Chihuahua.



Mammillaria applanata, which Englemann considered a separate species, was described in the same book, published in Washington on January 13, 1848.

Half way across the world in Germany, Muhlenpfordt wrote a description of the same cactus at the same time. He named it **M. heyderi**, and published the description in Allgemeine Gartenzeitung, Vol. 16, No. 20. Without a doubt both the American and the German publications were printed, proofread and corrected at the very same time, but for some reason (was it a German national holiday and the printers were given a day off?) the publication date of that issue of Allgemeine Gartenzeitung was January 15th, two days too late for Muhlenpfordt's name to rank as **the** name of the cactus.

Mammillaria gummifera var. **applanata** is a low-growing, inconspicuous plant that grows under trees and shrubs, five to ten cm in diameter, and very much flattened, rising only ten to twenty mm above the ground. The root body tapers to a point about five cm underground. The body of the plant is dark green, having many angled tubercles 10 mm long bearing at their tips ten to eighteen spreading radial spines surrounding a short, five mm, porrect central spine.

Cream to pink flowers appear from the axils and are followed by edible sweetish red fruits ten to fifteen mm long. The fruits are locally called "Chillitos," little peppers, from the shape, not the taste. People, birds and rodents relish the fruits.

Type locality: Rocky plains along the Pierdenales, western Texas.

Distribution: Southeast Arizona, southwest New Mexico, most of Texas.

REFERENCES

Benson, The Cacti of Arizona
Britton & Rose, The Cactaceae
Earle, Cacti of the Southwest

—WHE

Arizona Wildflower

WESTERN WALLFLOWER
Erysimum capitatum

Cruciferae
Mustard Family

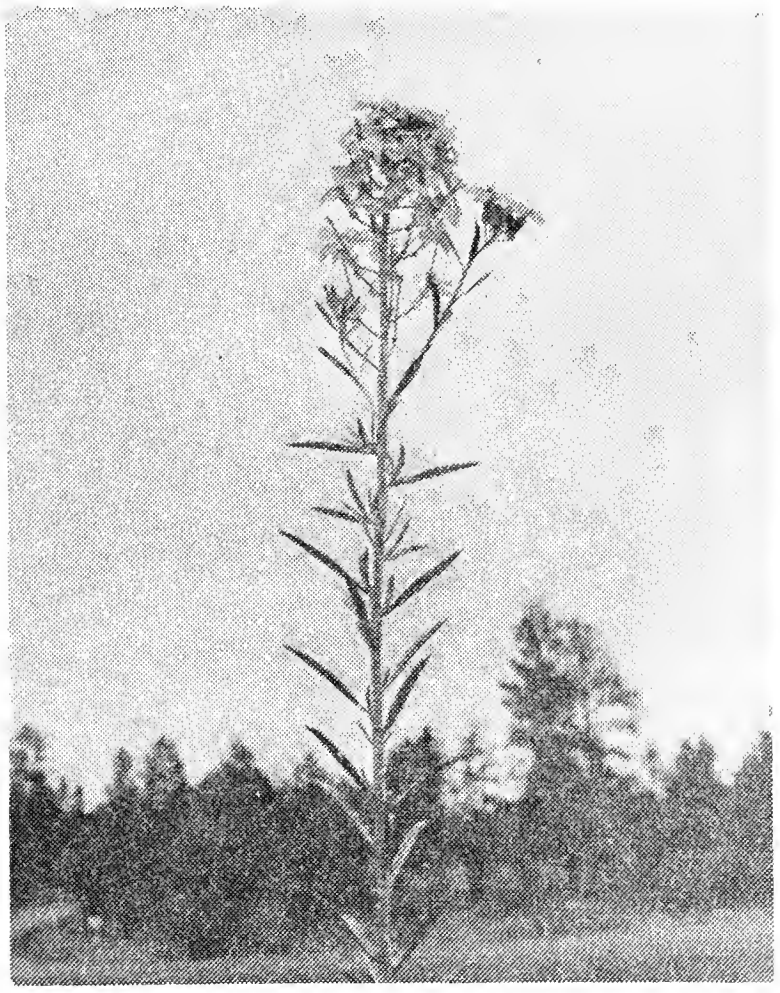
Hunt for information about this plant and you may get confused. One book will say "This cream-colored wildflower . . . " another "The flowers are orange . . ." And all the time you're looking at the yellow-flowered plant you've collected.

Are all the writers referring to the same species? They are, for the Western Wallflower **Erysimum capitatum**, is found in shades that range from nearly white through cream, lemon yellow, deep yellow and orange to brick-red, maroon and brown. Even purplish flowers have been seen in this one species.

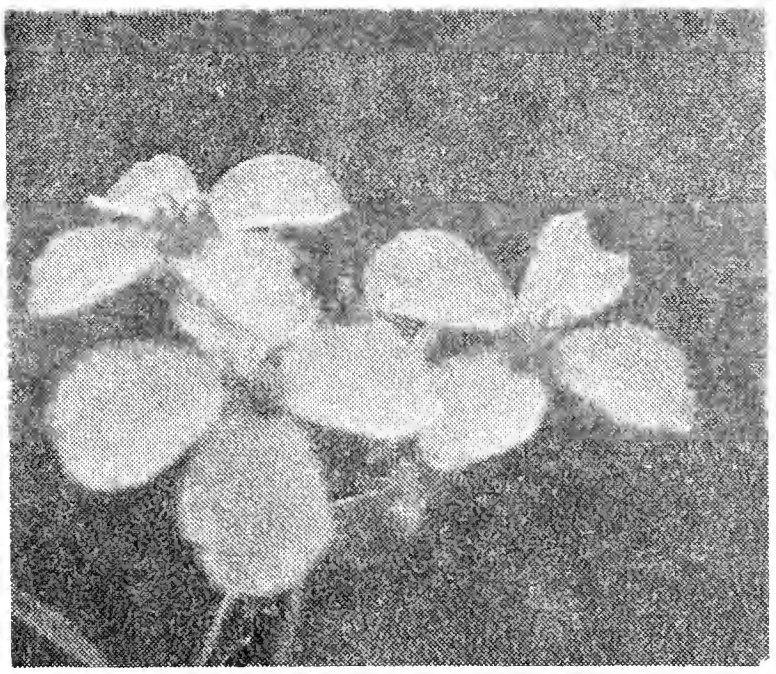
Some botanists would prefer to put the darker-flowered plants into a separate species, while others consider the variations in color insufficient reason to set up a new species. We are inclined to agree with the latter group. The predominating color of Western Wallflower in our Arizona mountains is a bright clear yellow. From time to time you will find a plant with all orange flowers, but (and this is why we feel that only one species is involved) you may also find plants where the yellow flowers are turning orange with age, and one stem may bear both new yellow and older orange flowers. Members of the Garden staff have seen orange-ageing Wallflowers near Four Peaks in the Mazatzals, at Walnut Canyon east of Flagstaff and at various places in the White Mountains. It has been suggested that the mineral content of the soil may influence the color of the plant, though no work has been done to determine if this is so.

At any rate, the Western Wallflower is easy to identify whatever its color.

Four rounded petals, arranged in the shape of a cross, make a flower that is nearly three-quarters of an inch wide. The flowers are fragrant and are arranged in a



Wallflower in bloom near Heber, 6000-ft. elevation, early August.



Cross-shaped petal arrangement, hence the family's name Cruciferae.

round-topped raceme. The slender leaves are up to six inches long at the base of the plant and sparingly toothed. Those on the upper stem are smaller, about two inches long, and are not toothed.

The fruits help identify this as a member of the Mustard Family. They are slender four-angled pods two to four inches long, growing upright or nearly so on very small stalks. Except at the very start of the flowering season, both flowers and seedpods are found on the same plant, which is another help in identification.

You will find Western Wallflower in the pine forest areas of Arizona at elevations up to 9500 feet. It blooms from March to September, most frequently in midsummer. It is a common wildflower and prefers dry, often rocky, open places. This preference for rocks is the reason for the name Wallflower, since its European relatives are commonly found growing in crevices of old walls and rock piles.

REFERENCES
Jepson, Manual of the Flower Plants of California
Kearney & Peebles, Arizona Flora
MacDougall, Grand Canyon Wild Flowers

LOOK FOR: Clusters of fragrant cross-form clear yellow flowers above thin upright pods; in dry, open areas; mid-summer in the mountains. Remember possible orange, yellow-and-orange plants.

—LD

As soon as petals drop, the thin upright seed pods begin to develop.

The Garden staff has been collecting seed of **Cosmos sulphureus** Cav. which was grown at the Garden for the first time this year. The seed of this bright orange Mexican composite was originally given to the Garden by the late Charles Mieg. It was collected in Mexico in 1968 according to the information on the seed packet. Due to bed space limitations, seeds were not planted until this year. The results have been excellent. Seeds were planted in March, but did not begin to develop until the weather turned warm in April. The plants then developed rapidly and flowered by the end of the month. They continued to flower into the third week of July.

The foliage is bright green and the flowers nod on the end of leafless stems in the slightest breeze.

The seed obtained is a variety having double flowers (two series of petals). Any Garden member wishing seeds of this plant may obtain them at the Garden Visitors' Building during open hours. Those wishing to do so may also obtain seeds by sending a self-addressed stamped envelope to the Garden at the following address:

DESERT BOTANICAL GARDEN
Seeds
P. O. Box 5415
Phoenix, Arizona 85010

ASPECTS OF THE DESERT

Along Oak Creek, between Sedona and the Verde Valley, the desert and the mountains meet. Here you find **Agave parryi** var **couesii** with its fifteen-foot flowering stalks, as well as juniper and the red-fruited Serviceberry (**Amelancher utahensis**). Elevation about 5100 ft.

Mexican Cactus

PEYOTE or PELLOTE
Strombocactus disciformis
Cactaceae

Strombocactus disciformis (the name means top-shaped, disc-like cactus) is a small plant found growing in crevices and under shrubs in very rocky areas of Queretaro. It is very symmetrical, so much so that the neatly arranged tubercles look like a small cluster of crystals.

This little turbinate or inversely conical cactus is five to six cm in diameter. Its tubercles are somewhat papery at the tips and slightly winged, bearing one to four white acicular spines when young. As the plant ages the spines drop off. There is wool in the areoles only when the plant is young.

The flowers are two cm long, dark pink to red, with white margins. They rise from the apex of the plant and are followed by white naked fruit seven mm long. The black seeds are relatively large, three mm in diameter.

This is a good plant for collections as it needs very little care — just good drainage.

Although the common name is Peyote, this cactus contains no hallucinogens. The better-known peyote that contains mescaline is **Lophophora williamsii.**

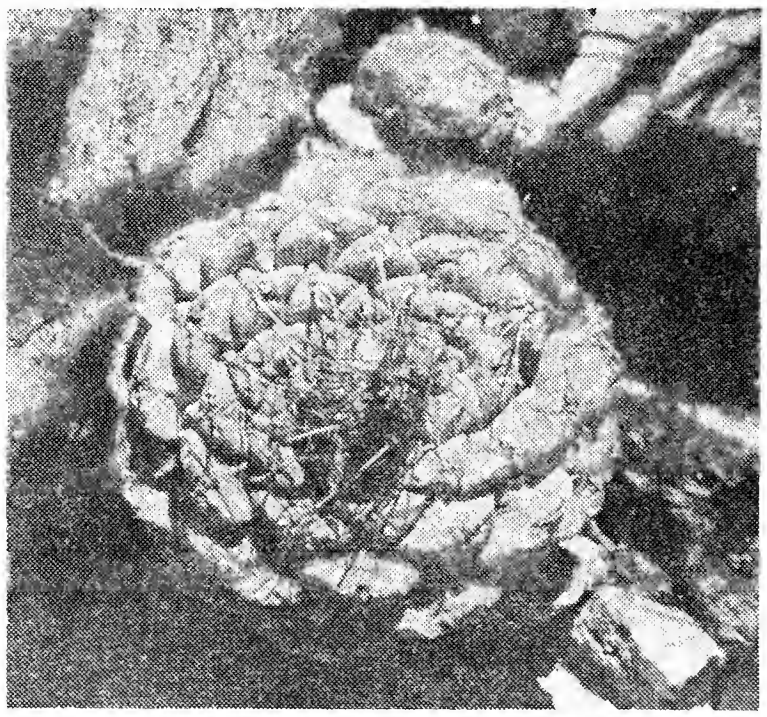
Type locality: Mineral del Monte, Mexico.

Distribution: Central Mexico.

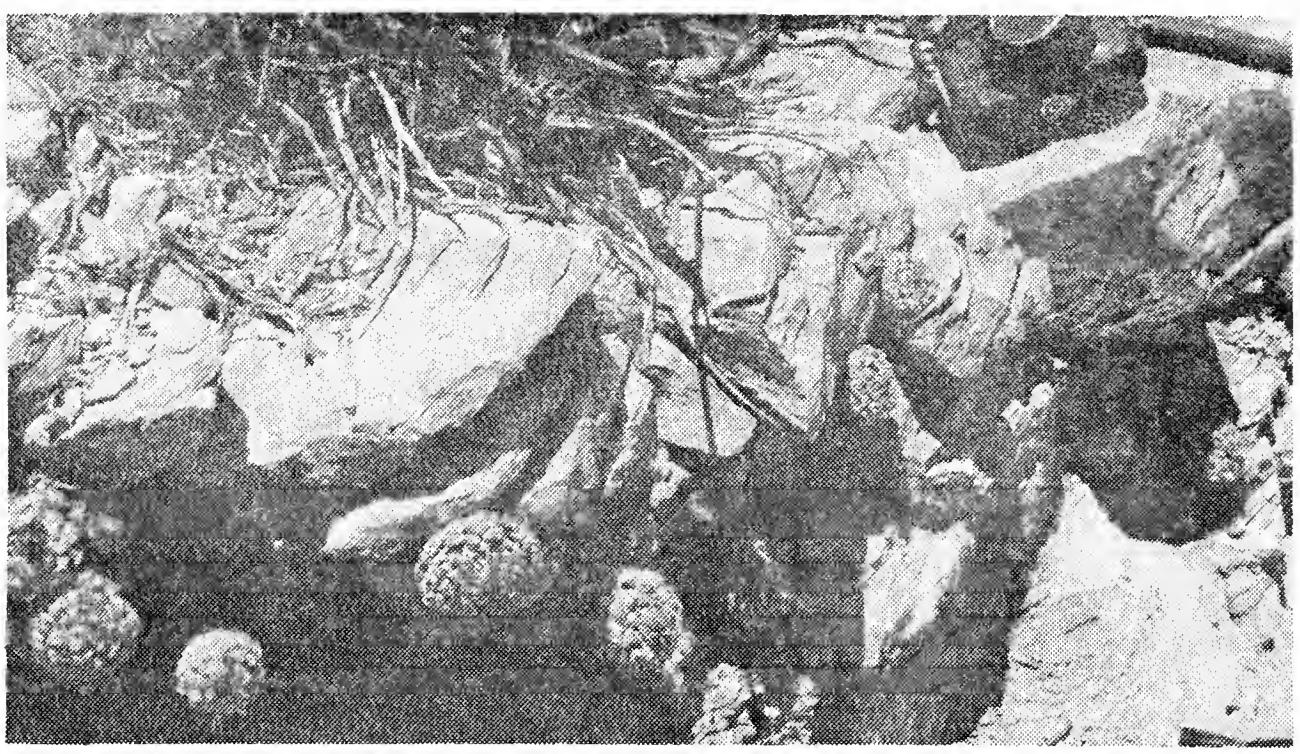
REFERENCES

Bravo, Las Cactaceas de Mexico
Britton & Rose, The Cactaceae

—WHE

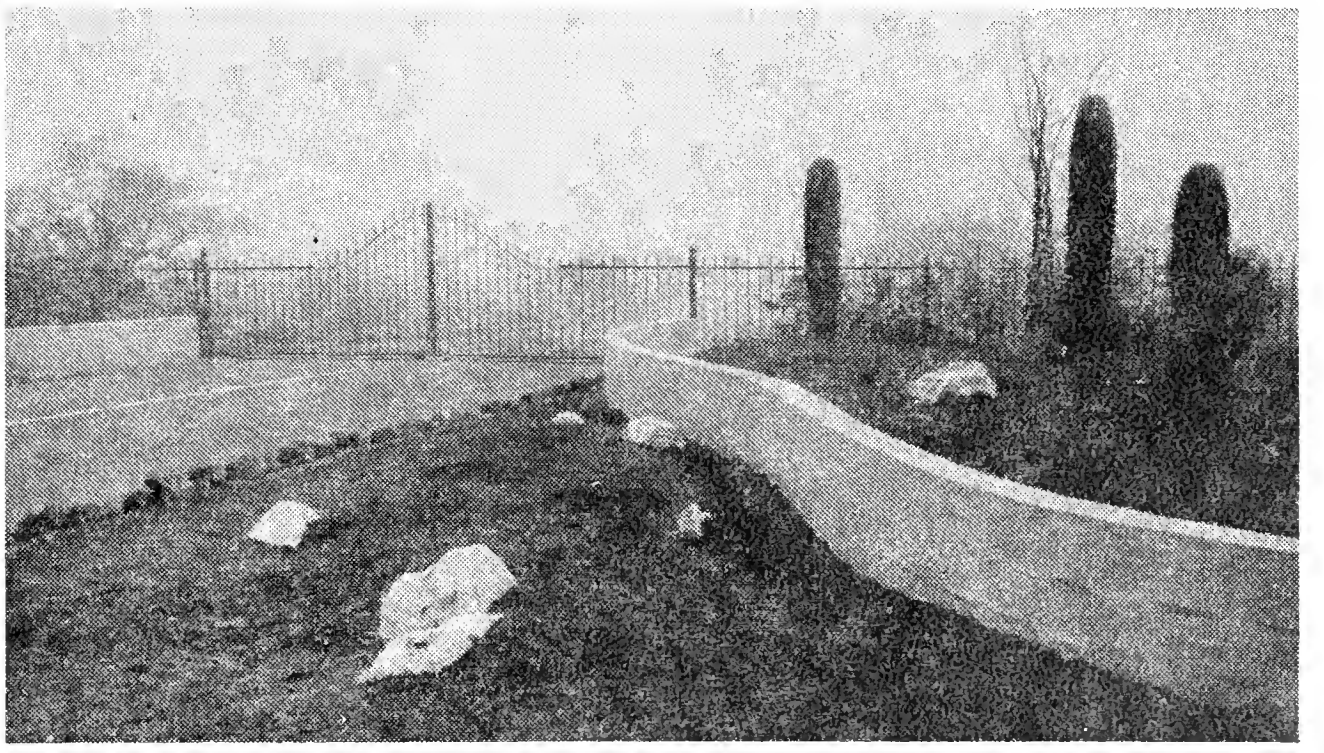


The plant above is only two inches in diameter. Below, a dozen-plus Peyotes are hidden in these rocks.



An unusual ground fog hung in the Garden on New Year's Day, enabling us to get striking photos of the impressive new Charles Mieg Memorial Gates erected at the Garden's entrance in December. The gates and the initial plantings were made possible by gifts from Mrs. Mieg and friends of Charles Mieg. We plan additional plantings of annuals and perennials. If you wish to participate in this remembrance, you may send your contributions to the Charles Mieg Memorial Fund at the Garden.

Dedication of the gates will be held this spring.



Lower right: the north entrance to the Papago Bike Path along our east boundary adjacent to the Cross-Cut Canal. It is part of an 11-mile scenic trail built by the City of Phoenix.

OUR HERBARIUM: AN ANNUAL REPORT

Our herbarium continued its growth in 1974 and the number of accessions is now closely approaching a total of 11,000 sheets. In midsummer, when the ten thousandth sheet was deposited, your Curator made a survey of the collectors represented in our herbarium and the following list with some annotations gives recognition to our major contributors up to that time.

Mr. E. R. Blakeley; our first curator of the herbarium (2051 numbers).

Mr. Lyle McGill; a former student horticulturist (1271 numbers).

Mr. George B. Hinton; an American mining engineer who became a prolific collector of Mexican plants (1072 numbers).

Dr. Donald J. Pinkava; an Arizona State University staff taxonomist (817 numbers).

Mr. Rodney Engard: our present superintendent (768 numbers).

Mr. John H. Weber; our former horticulturist (742 numbers).

Dr. Howard Scott Gentry; our staff botanist (602 numbers).

Mrs. Rose E. Collum, a mine superintendent's wife, whose plant collections in the 30's were an important contribution to our knowledge of the plants of Arizona (455 numbers).

Mr. W. H. Earle; you all know Mr. Earle (319 numbers).

Messrs. H. & M. Dearing; two avid plant collectors who were active in Arizona during the '40s (318 numbers).

The writer, your Curator, has contributed 1459 numbers.

Throughout the year, the staff continued its collecting activities and on three forays which are briefly described here added over 500 specimens to our shelves. In July, Mary Getz and Rodney Engard botanized in the States of Coahuila and Chihuahua, Mexico. They returned with a collection of over 200 species, many of them rare and infrequent. Then, in mid-August, Mary Getz, Rodney Engard and the writer collected over 100 plants on a one-day foray along Tonto Forest Road No. 64 which extends northwestward from Kohl's Ranch through Tonto Village to Rt. 87, north of Payson. At the end of August your Curator spent three days in the White Mountains and collected over 200 plants. Among them was *Bidens cernua L.* (Stick-tight), a species new to the flora of Arizona. In addition, Dr. Gentry contributed numerous specimens to our herbarium, the result of his many trips into Mexico in furtherance of his *Agave* studies.

In December, our herbarium initiated an exchange program with Brigham Young University, a project which should, in the ensuing years, add a representative collection of Utah plants to our holdings.

Finally, the writer while botanically active in the Northeastern States previous to his residence here, specialized in a study of the sedges, particularly the genus *Carex*. In the latter part of this year, this study was resumed and he has recently cooperated with Arizona State University in the diagnosis of collected material in this difficult genus. In addition, a small section of the herbarium has been reserved for what he hopes will be a representative collection of North American Carices.

—J. Harry Lehr

ON THE COVER: Mr. Greg Bouldin recently presented the Garden with this handsome seven-foot-high welded iron sculpture which he designed and executed himself. Mr. Bouldin's firm, Iron Motif, made the grillwork installed at the Garden last fall as well as the Mieg Memorial Gates. Though the phoenix actually rises from its traditional bed of flames, from the rear it looks as if it is rising from a sotol!

HELP!

Volunteers are desperately needed right now for pre-Cactus-Show preparations. Even if you can't make long-term commitments, will you try to lend us a hand between now and mid-February? Our staff and regular volunteers are already feeling the pressure of big and small jobs that must be done before the Show starts.

Here are some of the things that need doing. If you can give us a half-day or a full day — or more — each week for the next month, please, please let us know.

Lettering — if you can print reasonably neatly with a felt-tipped pen, you're needed to fill out section and division cards and some information cards that identify groups of entries. You don't have to be an artist. Two or three helpers here can be a great contribution to the over-all good looks of the Show. If you know anyone skillful enough to make simple posters, bring 'em along.

Press releases — A few volunteers to help type and mail out the stories we send to newspapers, radio and TV stations. We're about to send releases out, and will be sending them frequently up to and during the Show. You — with or without your portable typewriter — are greatly needed. (We'd also appreciate the loan of a few typewriters for the duration.)

Statistics — a lot of data from past shows needs getting together. Anne Amacker says it's a "tidying" sort of job that two or three volunteers can take care of in a few sessions.

Registering entries — to send out exhibitors' cards, to help register entries in the Show. If you haven't helped this way before, we'll brief you before D-Day.

Cactus-Show-Week volunteers are needed, too. This is to remind our nice "old-timers" to sign up again, and to let first-timers know what jobs Garden Volunteers do during that busiest week of the year. We need hosts and hostesses, guards, sales clerks, plant sellers, cashiers (lots), attendance checkers and willing errand-persons.

It's a mad, frantic time, and everyone enjoys it hugely. To get in on the fun — and the work — call Anne Amacker at 947-2800.

DECEMBER FIELD TRIP

On December 7, twenty-two Garden members and friends, with Rodney Engard as leader, travelled to Indian Springs in the Harcuvar Mountains.

Phoenix via Rts. 89 and 60 to Salome: **Baileya multiradiata** (Desert Marigold) blooming plants scattered along the bar-ditch. **Baccharis sarothroides** (Desert Broom) both small and very large plants, crowns very "cottony." **Peniocereus greggii** (Queen of the Night) one small plant in a field. And of course there were the huge fields of blooming roses just outside of Sun City.

Arroyo 12 miles west of Aguila: This stop was made especially for those folks wishing to collect material for fall arrangements. **Martynia** sp. (Devils-claws) young pods eaten as vegetable, split mature pods used in Pima baskets. **Cucurbita digitata** (Desert Gourd). **Oenothera** sp. (Evening Primrose) a low species.

Between Salome and Indian Springs: All 3 types of Crucifixion Thorn found in Arizona were seen — **Canotia holacantha** and **Holacantha emoryi** in the foothills and **Koeberlinia spinosa** right at Indian Springs. Within a radius of a few miles there were 5 opuntias: **Opuntia chlorotica** (Clock-face Prickly Pear) well-defined trunk, **Opuntia stanlyi** (Stanly's Club Cholla) low, mat-like cactus, **Opuntia bigelovii** (Teddybear Cholla), **Opuntia acanthocarpa** (Buckhorn Cholla), **Opuntia basilaris** (Beaver Tail Prickly Pear). **Ephedra viridis** (Joint-fir) valuable browse in winter when better forage is lacking. **Oenothera** spp. (Evening Primrose) a tall-blooming species and also the birdcage variety. **Mammillaria tetrancistra** (Corky-seed Pincushion) soft-

bodied plant. **Agave deserti**, Indians eat the soft white bases of the leaves, the tissue within the short stem, the young flowering shoots, and the flowers. Also important to wildlife — birds like the flowering stalks and small rodents make nests around the plants.

Indian Springs: **Nolina bigelovii** (Bear Grass) shorter flowering stalk than **N. microcarpa**, definite trunk, often branched with several large crowns of stiff leaves, one of the most xerophytic of the nolinas. **Hyptis emoryi** (Desert-lavender) large fragrant plants with small purple flowers. **Bebbia juncea** (Chuckwalla's Delight) yellow composite relished by chuckwallas. **Lotus rigidus** (Desert Rock-pea) a few blooming plants in the washes. **Pectis** sp. (Chinchweed, Fetid Marigold) small yellow heads. **Eriogonum fasciculatum** (Flat-top Buckwheat-brush) dense headlike clusters of pinkish flowers. **Prosopis juliflora** var **torreyana**, large leaflets. **Bernardia incana**, small shrubs, Euphorbiaceae. **Aloysia** sp., aromatic, shrubby plants with spikes of very small flowers, Verbenaceae. —MLG

FIELD TRIPS

Saturday, Jan. 4th, San Tan Mtns.: Near Sacaton, 60 mi. from Garden. Easy-to-medium walking. See Indian petroglyphs.

Saturday, Feb. 1st, Little Ajo Mtns.: Nearest town, Ajo, 120 mi. from Garden. Medium-to-difficult 2-mile hike. See organ pipe cactus.

All field trips leave the Garden parking lot at 8:30 a.m. and return between 4:30 and 5:30 p.m. Participants should bring lunches and wear suitable clothing. Call the Garden at 947-2800 for reservations.

GARDEN ACTIVITIES

JANUARY

Thurs. 2nd	LECTURE—Arizona Birds & Animals	3:00 P.M.
Sat. 4th	FIELD TRIP—San Tan Mountains	8:30 A.M.
Tues. 7th	CACTOMANIACS—John Cacheris, "Photographing Flowers"	8:00 P.M.
Wed. 8th	CLASS—Desert Plants	2:30 P.M.
Thurs. 9th	LECTURE—Arizona Scenics	3:00 P.M.
Wed. 15th	CLASS—Succulent Plants	2:30 P.M.
Thurs. 16th	LECTURE—Arizona Cacti	3:00 P.M.
Wed. 22nd	CLASS—Culture of Succulent Plants	2:30 P.M.
Thurs. 23rd	LECTURE—Arizona Wildflowers	3:00 P.M.
Sun. 26th	CENTRAL ARIZ. C & SS—Meeting	2:00 P.M.
Wed. 29th	CLASS—Desert Trees & Shrubs	2:30 P.M.
Thurs. 30th	LECTURE—Arizona Trees & Shrubs	3:00 P.M.

FEBRUARY

Sat. 1st	FIELD TRIP—Little Ajo Mountains	8:30 A.M.
Tues. 4th	CACTOMANIACS—Dr. Donald Pinkava "How Plants Got Their Names"	8:00 P.M.
Wed. 5th	CLASS—Culture of Desert Trees & Shrubs	2:30 P.M.
Thurs. 6th	LECTURE—Arizona Birds & Animals	3:00 P.M.
Wed. 12th	CLASS: Desert Trip—Vista Lookout	8:30 A.M.
Wed. 12th	Deadline for CACTUS SHOW Art Entries	5:00 P.M.
Fri. 14th -	All other CACTUS SHOW Entries received today and until 1:00 P.M. on the 15th	
Sun. 16th thru Sun. 23rd	28th ANNUAL CACTUS SHOW	Daily 9 - 5 P.M.
Thurs. 27th	LECTURE—Arizona Scenics	3:00 P.M.

TWENTY-EIGHTH ANNUAL

CACTUS SHOW

February 16th to and

including February 23rd, 1975

Sponsored by

The Desert Botanical Garden
and *The Phoenix Gazette*

Webster Auditorium

Desert Botanical Garden

1200 Galvin Parkway, in Papago Park

entrance via

5800 E. Van Buren or 6400 E. McDowell

Phoenix, Arizona

Telephone 947-2800

SHOW OPEN DAILY 9 A.M. TO 5 P.M. — ADMISSION TO SHOW FREE

CLASSIFICATIONS

SECTION I **CACTI***

Class A. **INDIVIDUAL POTTED SPECIMENS** (Limited to 3 named entries per division)

DIVISIONS

1. Ariocarpus
2. Astrophytum
3. Cereus
4. Chamaecereus
5. Coryphantha
6. Echinocactus
7. Echinocereus
8. Echinomastus
9. Echinopsis
10. Ferocactus
11. Gymnocalycium
12. Lobivia
13a. Mammillaria (hooked-spine)
13b. Mammillaria (milky)
13c. Mammillaria (other)
14. Neoporteria
15. Notocactus
16. Opuntia
17. Parodia
18. Pediocactus
19. Rebutia
20. Stenocactus
21. Thelocactus
22. Turbinicarpus
23. Any other species**
24. Seedlings

Class B. **CRESTED**
- Div. 1. Crested cacti, own root
- Div. 2. Crested cacti, grafted

Class C. **MONSTROSE**

Class D. **GRAFTED**

Class E. **COLLECTIONS** (5 or more different species of a genus. Judging will be on quality, not quantity.)

SECTION II **SUCCULENTS OTHER THAN CACTI***

Class A. **INDIVIDUAL POTTED SPECIMENS** (Limited to 3 named entries per division)

DIVISIONS

1. Aeonium
2. Agave
3. Aloe
4. Bromeliads
5. Bryophyllum
6. Crassula
7. Dudleya
8. Echeveria
9. Euphorbia
10. Gasteria
11. Haworthia
12. Hoya
13. Kalanchoe
14. Lithops
15. Mesembryanthemum
16. Pleiospilos
17. Sedum
18. Stapelia
19. Yucca
20. Any other species**
21. Seedlings

Class B. **COLLECTIONS** (5 or more different species of a genus. Judging will be on quality, not quantity.)

SECTION III **DESERT TREES AND SHRUBS***

Class A. **TREES**

Class B. **SHRUBS**

Class C. **DESERT BONSAI**

Class D. **SEEDLINGS**

Class E. **ANY OTHER DESERT PLANTS**

SECTION IV-A **PLANTERS** (rooted plants)***

Class A. **DISH GARDENS**

DIVISIONS

1. Cacti
2. Other succulents
3. Cacti & other succulents

*Grown by exhibitor at least 3 months.

**Additional Divisions will be set up when 3 or more species of a genus are entered.

Class B. **TERRARIUMS** (Cacti and/or other succulents)
Class C. **HANGING BASKETS** (Cacti and/or other succulents)
Class D. **STRAWBERRY JARS** (Cacti and/or other succulents)
Class E. **PATIO PLANTERS** (Cacti, other succulents and/or desert plants)

SECTION IV-B **ARRANGEMENTS** (no rooted plants)***
Class A. **CENTERPIECES**

DIVISIONS

1. Cacti
2. Other succulents
3. Cacti & other succulents
4. Dried Arizona desert material
5. Southwestern theme

The above divisions of Class A will apply to Classes B through E.

Class B. **ARRANGEMENTS** on or against the wall
Class C. **CORSAGES**
Class D. **BUTTON ARRANGEMENTS** (using a button as base)
Class E. **MINIATURE ARRANGEMENTS** (under 5" high)

SECTION V **PHOTOGRAPHY** (desert subjects)
(Exhibitor's original work. Each class will be divided into three subjects: Landscape, Wildlife and Plants. Only 3 mounted entries per person in any one subject.)

Class A. **BLACK & WHITE PRINTS**
Class B. **COLOR PRINTS**
Class C. **TRANSPARENCIES** (35mm or 55mm: 2x2 or 2¼x2¼)

SECTION VI **ARTS** (desert subjects)
(Exhibitor's original work, limited to 3 in any class. Entries in classes A through F must be framed, ready to hang. Watercolors and all drawings must be under glass.)

Class A. **OILS**
Class B. **WATERCOLORS**
Class C. **ACRYLICS**
Class D. **GRAPHICS******
Class E. **OTHER MEDIA, MIXED MEDIA**
Class F. **BOTANICAL ILLUSTRATION** (any medium)
Class G. **SCULPTURE**
Class H. **HANDICRAFTS**
Class J. **NATURAL DESERT WOODS** (uncarved)

SECTION VII **EDUCATIONAL EXHIBITS**

SECTION VIII **JUNIOR CLASS: NON-COMPETITIVE**
(Elementary school students may enter as individuals or as a group in any of the preceding classifications.)

SECTION IX **OPEN: NON-COMPETITIVE**

***One entry per division in each class. Accessories permitted, but no artificial foliage or flowers or artificial color. "Desert Spoons" not permitted. Points awarded for identification of materials.

****Included in this class are: pencil, ink, charcoal, pastel, lithographs, serigraphs, block prints.

The Twenty-eighth annual Cactus Show will be held in the Webster Auditorium, Desert Botanical Garden, February 16th-23rd, and is open to all persons wishing to enter in any of the aforementioned classifications. No entry fee is charged.

All entries in Sections V and VI (Photography and Arts) must be entered by Wed., Feb. 12th, 5 p.m. All other entries can be entered from Thurs., Feb. 13th to Sat., Feb. 15th, 1 p.m.

Judging will be held at 4 p.m. February 15th.

Sweepstakes will be awarded for the most Blue Ribbons accumulated in the first four Sections. Ribbons for 1st, 2nd, 3rd, and Honorable Mentions will be awarded, if merited, in all classifications. Small trophies will be given for outstanding exhibits in the various classes.

In Sections I through IV-A winning exhibits of 1974 may not be entered in this year's Show. In Sections IV-B through IX no entries previously exhibited in the Show will be accepted.

Scale of points is as follows:

CACTI & SUCCULENTS SPECIMEN PLANTS	
Condition	45
Nomenclature	15
Rarity	10
Size or degree of maturity	10
Staging	20
	100

BUTTON and MINIATURES	
Scale	40
Design	30
Color harmony	20
Condition	10
	100

ARRANGEMENTS & DISH GARDENS	
Design	30
Color	20
Identification of material	10
Originality	20
Distinction	10
Condition	10
	100

CORSAGES	
Technique	15
Design	25
Color	15
Suitable combination of material	15
Distinction	20
Condition	10
	100

Exhibits may be removed only after 5 P.M., Sunday, Feb. 23rd. The Garden will take all due care but will assume no responsibility for loss or breakage, or for unclaimed exhibits.

The "Handbook for Flower Shows," published by the National Council of State Garden Clubs, Inc., will be used as the basis of exhibiting, point scoring and judging of all Arrangements, Dish Gardens, Miniatures, etc. The Standard system of Judging will be used. The decision of the Judges will be final.

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

Volume XXIX February, 1975 No. 2

REG MANNING

SAGUAROLAND BULLETIN

Published and owned by the Arizona Cactus and Native Flora Society, sponsors of the Desert Botanical Garden of Arizona, P.O. Box 5415, Phoenix 85010. Saguaroland Bulletin attempts to promote the Garden and to provide information to the desert plants and their culture. Subscription $5.00 per year, the subscription including active membership in the Society and the Desert Botanical Garden. Issued 10 times a year.

W. HUBERT EARLE, Editor
LILLIAN DIVEN, Associate Editor

Volume XXIX | February, 1975 | No. 2

Arizona Cactus and Native Flora Society

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COVER: *Jatropha macrorhiza* (see p. 16)

Desert Botanical Garden of Arizona

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Garden Open Daily 9 A.M.-5 P.M. Including Holidays

Editor's Notes

February has always been an important month at the Garden, as the last full week of the month is the time of the annual Cactus Show.

The first Cactus Show was held in the spring of 1938 at Thompson's Tropical Gardens nursery at 45th Street and Thomas Road. A report in the Cactus and Succulent Journal for July of that year is headed "Arizona Cactus Show Prize Winners." The following winners were announced: "Boyce Thompson Arboretum, Sweepstakes. Gustav Starck, 5 ribbons. Bool's Sandyland Cactus Garden, non-competitive landscape and colorful arrangement of bowls, Honorable Mention. J. Whitman Evans won rarest plant prize with an unidentified species from Colorado. His collection of Melocacti included 13 species. Mrs. Gertrude Webster's plants were the outstanding feature. **Astrophytum ornatum** headed a large showing of Astrophytums. Her exhibit included 35 Euphorbias and 6 immense Echinopsis."

You can see that the exhibitors were members and supporters of the Arizona Cactus and Native Flora Society who later built the Desert Botanical Garden in Papago Park and dedicated it in February, 1939, with George Lindsay as the first director. The present Webster Auditorium was subsequently built and dedicated January 21, 1940.

The next Show was held after World War II in the Webster Auditorium in February 1948, when the late W. Taylor Marshall was director. There were twelve exhibitors with 152 entries and ten commercial exhibitors.

The shows have run annually ever since then, and this year's 28th Show is certain to be another success.

Do exhibit your plants OR volunteer your services for a day or so, OR **come see the Show.**

Do check the deadlines for entering your exhibits.

Do volunteer some of your time to help visitors enjoy the Show. Meeting them and answering their questions is always interesting. Anne Amacker, our genial Secretary, will be most happy to have your name and the date you can help out. Remember **not** to bring your lunch. Show volunteers will be our guests for a nice meal prepared by Thelma MacDougall and her crew of volunteer gourmets.

Do thin out the excess plants in your garden and donate them to the Show's plant sales table.

DO COME!

A timely and generous donation was made to the Garden last month by Thomas H. Nash III and Elizabeth H. Nash of Tempe in memory of Miss Anne Nash, who was a plant enthusiast. The donation was used to purchase nine large flats of plants which were set in the new beds at the Garden's main entrance and in other beds in the Garden. They will continue to make splashes of color in the Garden for many years.

Arizona Wildflower

Gaura gracilis

Onagraceae
Evening Primrose Family

There's no common name for this relatively common plant, though a similar species in Texas has the revoltingly cute name of "Kisses." You can call it that, if you want to, but we'd rather not, thanks.

This member of the Evening Primrose Family isn't a showy flower. Blossoms are a tired washed-out red, not pink but just a faded red, and at their biggest are no more than a half-inch across. The plants are usually spindly, weedy, and if they occured only singly they would be overlookable things that only a true botanist could love.

But **Gaura gracilis** normally grows in a good-sized colony, so it is a very visible part of the upland flora, and the numbers of small flowers make the plant delicately attractive.

Our herbarium has more than fifteen specimen sheets of this one plant, all different. It is such a variable plant that you will find some specimens that are

G. gracilis in bloom near Heber, 6200 ft. elevation, early August.

Some plants are leafier than this, some less so. Height also varies.

seven inches tall and others that are four feet tall. Stems range from slender to very thick, from sparsely-leaved to very leafy. Leaves are any length from half an inch to over two inches. Nevertheless, this is not a hard plant to identify when it is in bloom, and the long blooming season, May to October, gives you a long time to learn its characteristics.

The four sepals are rolled lengthwise and are folded back along the stalk, almost parallel to it, but curled slightly outward at the tips. The rest of the flower is "parted," the four petals to one side and the eight long stamens and the even longer style to the other. You will notice that the style has a tiny cup (called the hypanthium) just below the tip. The flowers are arranged in spikes. They open in the evening, like others in the family.

The narrow, linear leaves occur along the whole length of the stems, which branch out from the base of the plant.

Gaura graciilis is a biennial or short-lived perennial distributed throughout Arizona except for the westernmost part of the state, at elevations ranging from 250 ft. to 9000 ft. It grows in canyons, along streams, and along roadsides. This species is found from west Texas to Arizona and northern Mexico.

REFERENCES
Kearney & Peebles, Arizona Flora
Rickett, Wild Flowers of the United States, Vol. IV

LOOK FOR: Four-petaled "parted" flowers, washed-out reddish; drooping style with cup near tip. Mountains, spring through summer; colony of plants.

—LD

Desert Perennial

Jatropha macrorhiza Benth.

Euphorbiaceae
Spurge Family

This thick, fleshy-stemmed perennial is a common range weed in desert grasslands, on alluvial slopes, mesa tops, plains and sandy flood plains where deep soil allows the development of its large tuberous roots.

Its range begins on the eastern edge of the Sonoran Desert at the margin of the Lower Sonoran Zone and continues upward through the Upper Sonoran Zone. In Arizona it is found at elevations between 3000 and 7400 ft. in Apache, Cochise, Santa Cruz and Pima counties. In addition, it is found in southern New Mexico and south to central Mexico. It has also been reported from Presidio County, Texas.

Since it is unpalatable to livestock, it frequently stands out in overgrazed ranges. Under good conditions the foliage is lush dark green and the plant may attain a height of 2-8 dm (to 32 inches). But, depending upon the weather during the immediate growing season, the above-ground portion of the plant may be little more than a pale pink to yellowish stem with a cyme of a few depauperate pink flowers and a few shriveled axial bracts.

We came across both conditions within ten miles of each other in July of 1974. The depauperate plant grew in abundance on a barren alluvial hillside near San Lorenzo, Chihuahua. A few miles beyond, we stopped to examine a broad-leaved, lush herb growing on the dusty flood plain of the Rio Santa Clara. It, too, proved to be the ubiquitous **Jatropha macrorhiza**, but in full flower, fruit and leaf.

The ability of this plant to flower and fruit under such varied circumstances is due to the moisture and energy reserve available from the one or more fleshy, sweet-potato-shaped roots. The tuber may

be up to 10 cm in diameter and 20 cm long (four inches and eight inches).

The features of a robust plant are described below. The foliage and simple branching occur from a solitary, stout, erect stem. The leaves, which are rich green by comparison with the surrounding gray-green desert, are palmately 3-to-9-lobed, the sinuses usually extending half the leaf length. Leaves may be 18 cm long and 15 cm wide (seven inches by six inches) or they may be broader than they are long. The lobes of the leaves are ovate to lanceolate, the margins are coarsely serrate, each tooth usually tipped with a slender flexible bristle. Leaf bases are subcordate. Petioles may be 3-12 cm long, the bases subtended by stipules which are 1 cm long and finely dissected.

The densely flowered cymose inflorescences occur on 1-6 cm long peduncles. Branches of the inflorescence are sparsely puberulent. The plants are monoecious. Staminate flowers occur on the distal end of the cyme. Sepals are entire, lanceolate, and about half as long as the petals. The stamens, which number eight to ten, have short anthers and are united into a cylinder near their bases. The inner whorl of stamens is longer than the outer. The corolla is whitish to light pink, about 2 cm long. Pistillate flowers are nearly like the staminate, but lower in the cyme. The sepals are usually larger and spinulose-dentate. The ovary is 3-celled, one ovule per locule. There are three styles about 12 mm long. The pubescent or glabrous capsule is 10-13 mm long and nearly as wide, 3-lobed. The capsule dehisces at maturity.

Large, very green leaves of *J. macrorhiza* are very noticeable.

Seeds are about 9 mm long, buff with brownish or reddish flecks and spots. The caruncle is fan-shaped with a papery laciniate margin. Flowering occurs from May to October.

J. macrorhiza was originally described in 1839 by Bentham. Arizona specimens at one time were regarded as a distinct species, **Jatropha arizonica** I. M. Johnston. The type of this latter plant was collected in 1882 by Pringle in the Santa Rita Mountains. Currently, Arizona specimens are treated as **J. macrorhiza** var. **septemfida** Engelmann.

The only reference to a use for this plant I have located is a remark that the roots are strongly purgative. Its ornamental potential is negligible because of its small flowers and rather coarse, weedy appearance.

Field Marks: Large palmately-lobed dark green leaves. Single stout fleshy stem from a tuber. Cymes of ¾ in. pink unisexual flowers. In open ground about 2500 ft. in the eastern and southeastern portions of the state.

REFERENCES

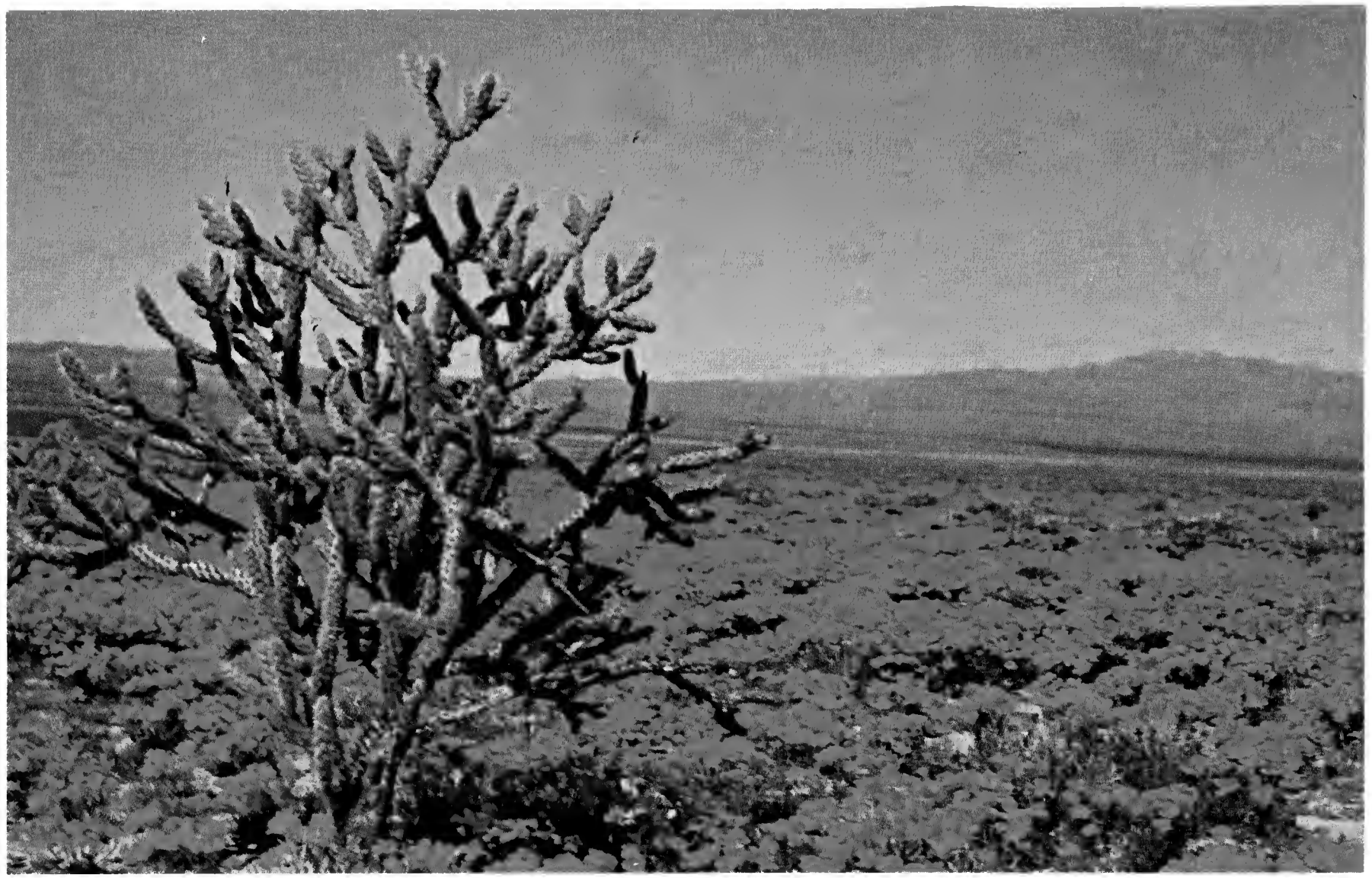
Correll and Johnston, Manual of the Vascular Plants of Texas.

Coulter, Botany of Western Texas

Kearney and Peebles, Flowering Plants and Ferns of Arizona

—RGE

ASPECTS OF THE DESERT



This spring scene photographed west of Wickenburg may be repeated a hundred times in central Arizona IF (as we note on page 22) we get the right combination of rains and temperatures this winter. Acres of golden poppies (*Eschscholtzia californica*) are common.

Arizona Cactus

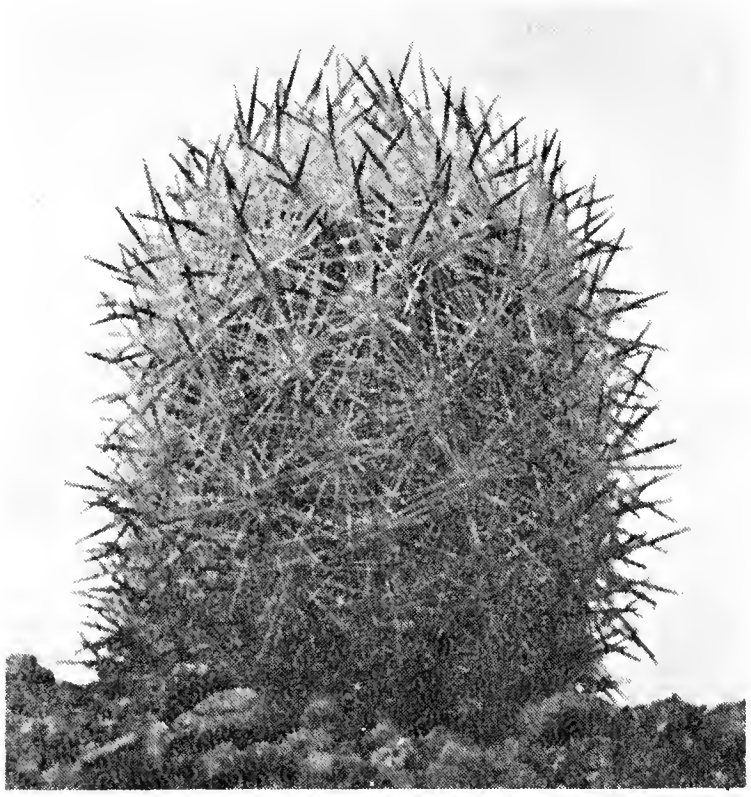
FOX TAIL

Coryphantha alversonii
Cactaceae

This perky little pincushion is found through a great part of the Mohave and Colorado Deserts of California and southeast Nevada. It is also found scattered sparingly in the northwest corner of Arizona (the "Arizona Strip Country"). It is a hard plant to locate among the rugged cliffs and washes of that area, yet you will find it growing up to the edges of the roads in California and Nevada at elevations of 250 to 4000 ft.

The simple, cylindrical plant with underground branching rhizomes is found in loose sandy soil and among boulders in association with creosote bushes and salt bushes. It will grow up to 20 cm tall and 3 cm in diameter, frequently forming loose clusters about 30 cm wide.

White to silver spines cover the plant densely. The eight to ten centrals, 3 cm long, are all black-tipped white. The stout white radials (12-18), 3 cm long, create an impregnable shield for the body of the plant.



Notice the black-tipped spines of this 3½-inch-high *C. alversonii.*

Pink to magenta flowers, two to three cm in diameter, appear at the apex of the stem in late spring or early summer, depending on elevation. The outer sections of the petals are margined with small, fine hairs. Later, gray-green club-shaped edible fruits appear, 2 cm long, bearing tan seeds that are 2 mm long.

Coryphantha alversonii was first described in 1894 as **Cactus radiosus alversonii** by Coulter in honor of Andrew H. Alverson (1845-1916), a jeweler, mineralogist and cactus dealer who made several prospecting trips into the Eagle and Chuckawalla Mtns. of California, where he collected these plants for the trade. In 1895 Zeissold transferred the plant to the genus Mammillaria as **M. alversonii**, and in 1898 Schumann moved it to subspecies status as **M. radiosa alversonii.**

In 1929 Britton and Rose in "The Cactaceae" relegated it to synonymy with **Coryphantha deserti.** Your writer, in 1963, with more information available, separated it into its own species, **C. alversonii**, in "Cacti of the Southwest." Benson, in "The Cacti of Arizona," 1969, set up the new combination **C. vivipara** var. **alversonii**. This is a distinctive plant, as the persistence of the name **alversonii** indicates.

Type location: Twentynine Palms, California.

Distribution: Riverside, Imperial and San Bernardino counties of California; northwest Mojave County, Arizona.

REFERENCES

Benson, Cacti of Arizona
Britton & Rose, Cactaceae
Earle, Cacti of the Southwest
Jaeger, Desert Wildflowers

—WHE

THE VERSATILE CANDELILLA

If you're a label reader, you may have noticed that an ingredient in the new small mints with the advertised "wow" taste is Candelilla wax. The colorless and tasteless vegetable wax is probably used in the last sugar coating of the mints to keep them glossy and to keep them from sticking together in humid weather. But that is only one use for this very interesting desert plant.

The Candelilla is a native of dry, northern Mexico, which visitors to the Garden can see just off the path near the Woollyhead Barrels a short way north of the bridge. It is an eye-catching 3-ft. high clump of almost leafless stems, pencil-thin, pale green and very smooth.

There are scores of ways this plant has been used. First of all, its botanical name, **Euphorbia antisyphilitica**, indicated its medicinal use. For centuries the milky juice was widely used in Mexico for treatment of venereal diseases. Like the juices of most members of the Spurge Family, it is a purgative, and must have some medicinal properties, although modern medicine has ceased using it.

More important economically is the wax that covers the branches. First used for church candles, it is still used for candles in combination with paraffin by country people who value the bright light and pleasant scent the candles give.

Industrial uses of Candelilla wax are many. Besides obvious applications such as substitution for beeswax and carnauba in shoe polish, auto polish, crayons and floor wax, the wax has been found valuable in the manufacture of carbon paper, litho and printing and stamping inks, ointments and cosmetics, explosives, varnishes and paint removers, linoleum, celluloid and plastics. Before the introduction of vinyl LP records, a large amount of Candelilla wax was used in the manufacture of phonograph records.

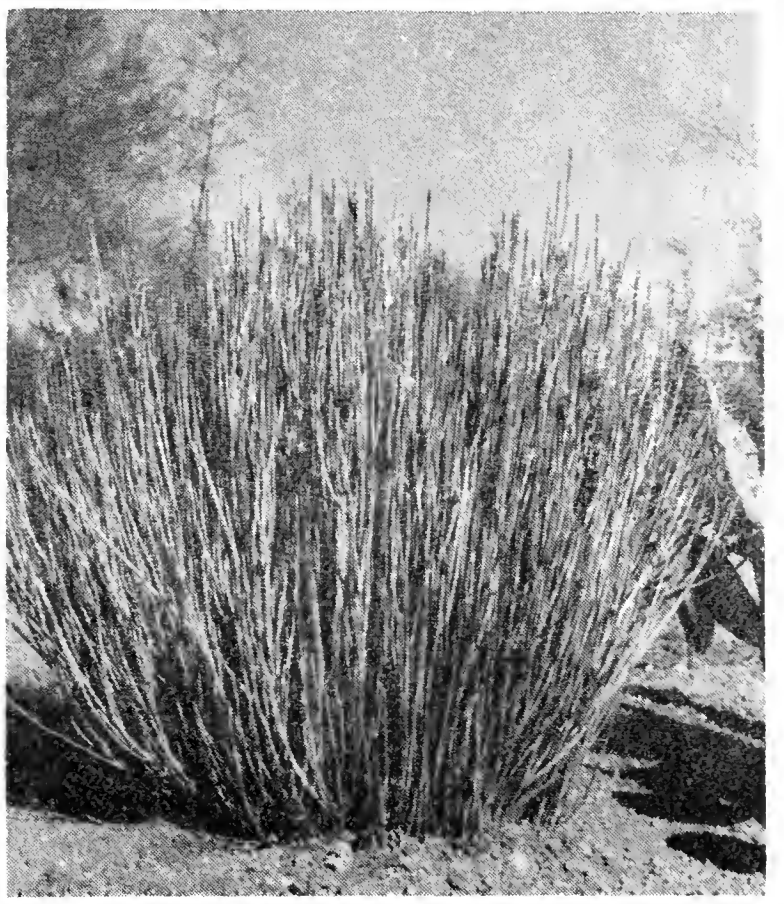
Current uses include insulation coatings, sizing and finishing compounds, and more uses are being found for this versatile substance.

In "Economic Botany" Vol. 10, No. 2, 1956, Hodge and Sineath reported that three million pounds of the wax were used annually in the United States in the manufacture of chewing gum, and over four million pounds in the manufacture of coating and polishing preparations.

Candelilla wax has been known to commerce since 1912, but it did not achieve much prominence until 1936. In the next twelve years the demand for it grew so much that in 1948 the Mexican authorities had to put a complete ban on production because it was believed that the plant was in danger of extinction. The ban remained in effect until 1954.

What makes this valuable commercial product especially interesting is that the collection and extraction of the wax is a very primitive series of operations, migratory in nature and using the simplest equipment.

The wax is obtained only from wild



A large clump of Candelilla growing here at the Garden.

plants in the desert and semi-desert areas of Coahuila, Nuevo Leon, Durango, Zacatecas, San Luis Potosi and Chihuahua. The production is in the dry months between October and June.

Once an area with thick stands of Candelilla is found, an extraction camp is set up. The wax gatherers range widely from the base camp, pulling plants up by hand and loading them on burros. In some area the plants grow so thickly that up to ten tons per acre are gathered.

At the extraction camp the plants are dumped into a large tank and covered with water, and a fire is built beneath the tank. Sulfuric acid is added to the tank, and the contents boiled until the wax coating on the stems melts and floats to the top. The plants are removed and dried for subsequent use as fuel for the tank, and the waxy scum set aside.

From ten to fifteen tankfuls a day are processed, and at the day's end the collected wax is reboiled with more acid. After this step the solidified wax is shipped to refiners in one of the large cities of the area for further refining. The main refineries are in the cities of Chihuahua, Torreon and Saltillo.

When all the nearby plants are collected, harvesters and burros move on to the next area, the tank is loaded on a rickety truck, and a new camp is set up.

And on television a blonde with about fifty perfect white teeth holds up a plastic box of mints and says "Wow!"

IF, WE HOPE

IF there's enough rain.

IF it doesn't freeze after a warm spell.

IF we don't get a lot of hot, windy weather.

IF March and April follow February, as scheduled.

WE HOPE we'll have a wildflower-full spring this year.

And if we're at all lucky we'll see the first of the wildflowers toward the end of this month. Look first in wind-free, south-facing spots where the rocks retain the sun's heat. Look beneath trees near washes that get that little extra bit of rain water.

The earliest wildflowers you'll see (some might already be blooming) are sand verbena, hummingbird bush, desert marigold, desert mallow and fairy duster. The various buckwheats are early-flowering, as is pentstemon. A couple of the composites and probably some phacelias come out well in advance of the rest of the wildflowers. It's a mistake to wait too long to go out wildflower-hunting. Our spring season is longer than most people imagine.

Do get, if you don't have it already, the very good little book put out by the Southwest Monuments Assn.: Wildflowers of the Southwest Deserts. Easy to use and well illustrated. It's for sale at the Garden's Bookstore. $1.50 if you come get it, $1.75 postpaid if you want it mailed. Another useful book is Jaeger's Desert Wild Flowers, $2.95, or $3.35 postpaid.

And plan to come on our monthly Field Trips. Details are on page 24.

Note from the Herbarium

A survey of herbarium resources in America has been completed and published by a committee of the American Society of Plant Taxonomists. In this survey a weighted rating system was projected for the over 1100 United States herbaria. The index values used for the ratings were varied and included total number of specimens, garden and or library facilities, quality and size of staff, and professional activity. The scoring system itself was developed to allow an institution as many as 40 points. It is gratifying to know that we not only scored 17 points, but, in addition, our herbarium was included among the 105 institutions recognized as the National Resource Collections Group. ——JHL

Mexican Cactus

PITAHAYO

Lemaireocereus martinezi
Cactaceae

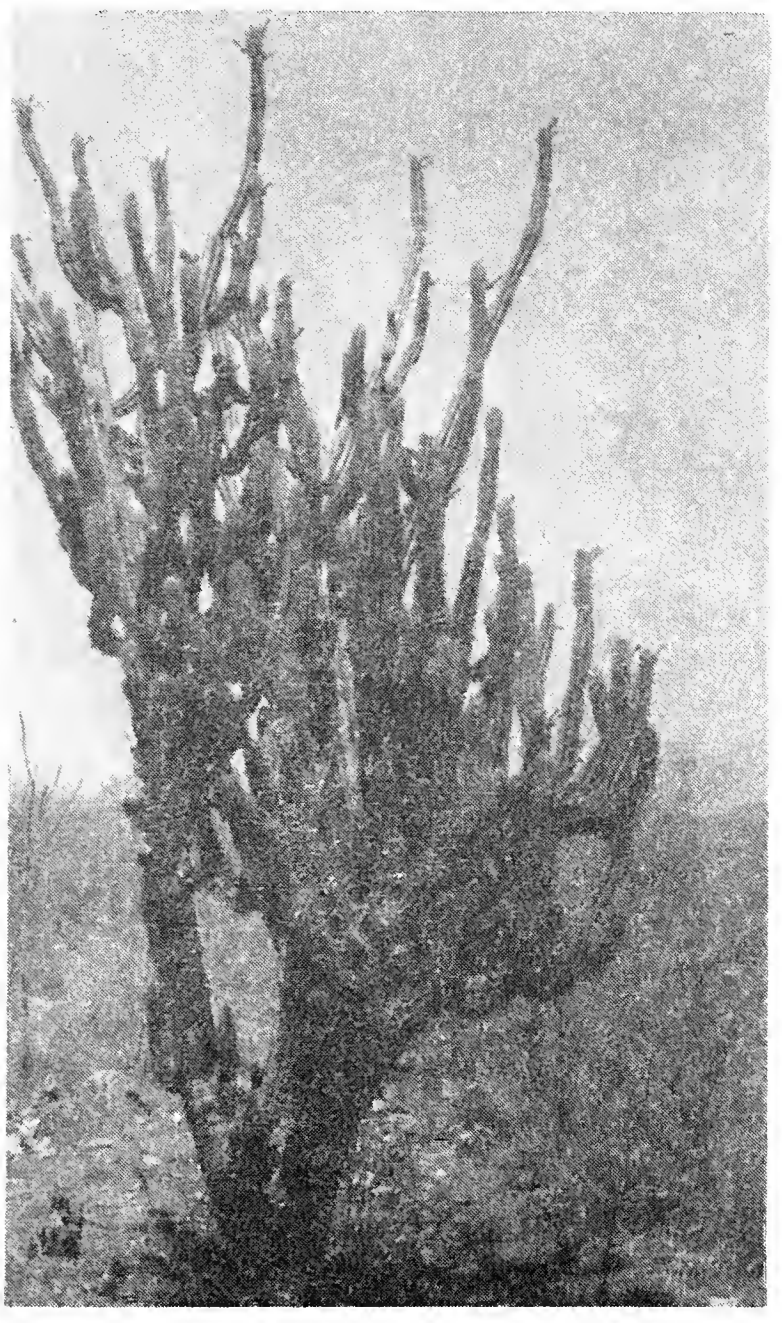
Here is a seldom-noticed cereus sparingly distributed in the thorn-forest zone of Sinaloa and Sonora.

It is an arborescent plant three to five meters tall, about two meters wide, with a trunk one to two meters high and many limbs branching from each other, forming a dense center of criss-crossed limbs.

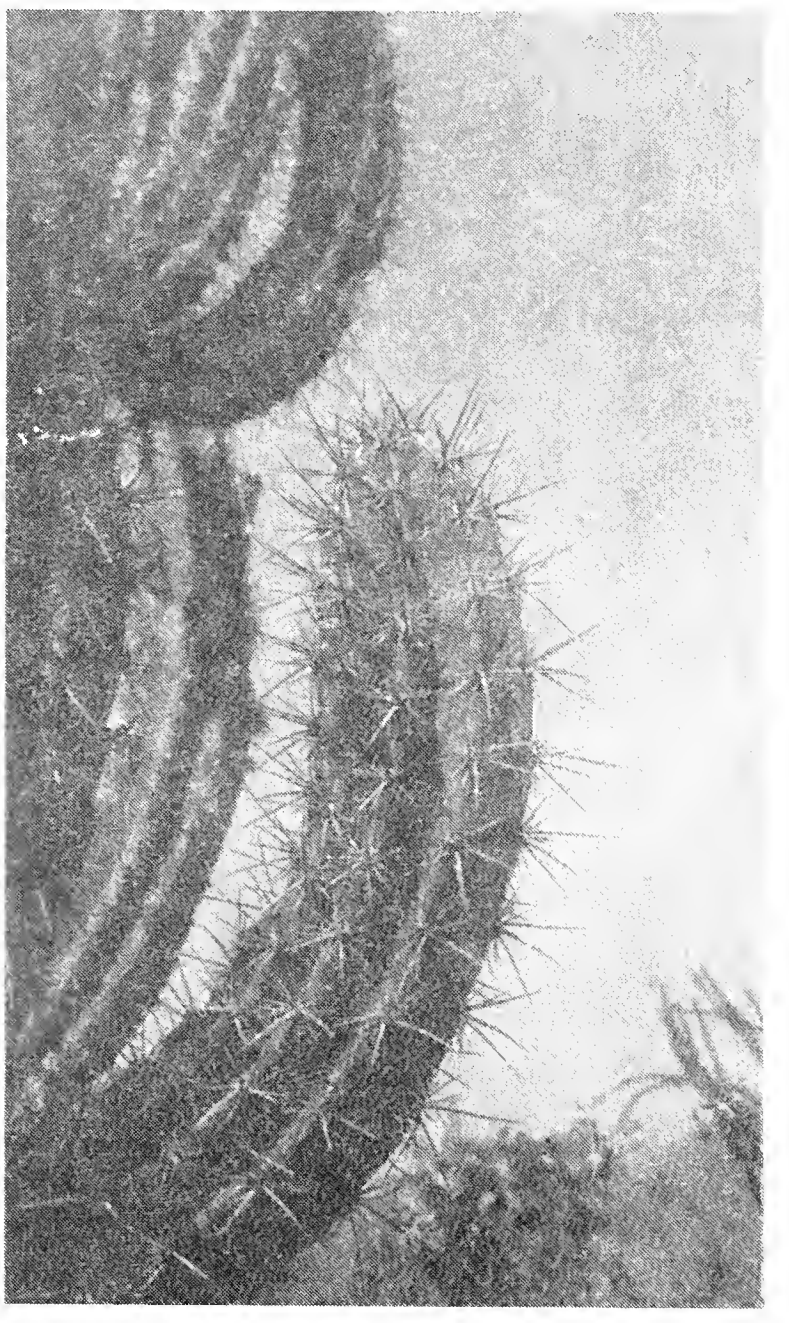
The dark-green limbs are 15 cm in diameter with nine sharp ribs bearing 10-mm-wide areoles spaced about 5 cm apart the entire length of the rib. The areoles are dark when young, changing to white in age.

In each areole is a main porrect central spine 4-5 cm long, surrounded by 5-6 spreading sub-centrals 3-4 cm long and, under these, 7-11 thin spreading radials 2-10 mm long. All the spines are a light color with dark bases.

The plant resembles **L. thurberi**, our Arizona Organ Pipe Cactus, while it is young or up to one meter tall. Then **L.**



At Kilometer 1439 on the Mazatlan-Navajoa highway, a 21-ft. Pitahayo.



L. martinezi spines, 2-in.-long here, are longer than those of *L. thurberi.*

martinezi central spines begin to lengthen and develop a slight curve, and the plant can be distinguished from the Organ Pipe with its shorter, straight spines. Spine color lightens at this time in **L. martinezi**, while **L. thurberi** spines remain black. Another difference is that Organ Pipe has no main trunk, **L. martinezi** has a trunk.

We first found this plant in 1959 while on a collecting trip with Andre Cuenoud and the late Charles Mieg. Later, with Charles and Hans Krainz of Switzerland, we found the plant bearing faded white flowers. We have not yet observed the fruit, but know it is edible, as evidenced by the common name "pitahaya," which is applied to a number of edible cactus fruits.

We have introduced cuttings of this plant to the Garden, but all have frozen in our winter. This is a cereus that would have to be grown indoors.

Type locality: Municipality of Mazatlan to Navajoa.

REFERENCE

Bravo, Las Cactaceas de Mexico

—WHE

FIELD TRIPS

Saturday, February 1, Little Ajo Mtns.: Nearest town, Ajo, 120 mi. from Garden. Medium-to-difficult 2-mi. hike. See: organ pipe cactus.

Saturday, March 1, Seven Springs: Nearest town, Carefree. 60 mi. from Garden. Medium-to-easy 1-mi. hike. See: chaparral-riparian vegetation.

All field trips leave Garden 8:30 a.m., return before 5:30 p.m. Bring lunch, wear suitable clothes. Call Garden at 947-2800 for reservations.

GARDEN ACTIVITIES

FEBRUARY

Sat.	1st	FIELD TRIP—Little Ajo Mountains	8:30 A.M.
Tues.	4th	CACTOMANIACS—Dr. Donald Pinkava "How Plants Got Their Names"	8:00 P.M.
Wed.	5th	CLASS—Culture of Desert Trees & Shrubs	2:30 P.M.
Thurs.	6th	LECTURE—Arizona Birds & Animals	3:00 P.M.
Wed.	12th	CLASS: Desert Trip—Vista Lookout	8:30 A.M.
Wed.	12th	Deadline for CACTUS SHOW Art Entries	5:00 P.M.
Fri.	14th -	All other CACTUS SHOW Entries received today and until 1:00 P.M. on the 15th	
Sun. thru Sun.	16th 23rd	28th ANNUAL CACTUS SHOW	Daily 9 - 5 P.M.
Thurs.	27th	LECTURE—Arizona Scenics	3:00 P.M.

MARCH

Sat.	1st	FIELD TRIP—Seven Spring	8:30 A.M.
Tues.	4th	FLOWER PRESERVERS	9:00 A.M. & 1:00 P.M.
Tues.	4th	CACTOMANIACS—Meeting	8:00 P.M.
Wed.	5th	CLASS—Desert Plants	2:30 P.M.
Thurs.	6th	LECTURE—Arizona Cacti in Flower	3:00 P.M.
Tues.	11th	FLOWER PRESERVERS	9:00 A.M. & 1:00 P.M.
Wed.	12th	CLASS—Succulent Plants	2:30 P.M.
Thurs.	13th	LECTURE—Arizona Wildflowers	3:00 P.M.
Tues.	18th	FLOWER PRESERVERS	9:00 A.M. & 1:00 P.M.
Wed.	19th	CLASS—Culture of Succulent Plants	2:30 P.M.
Thurs.	20th	LECTURE—Arizona Trees & Shrubs	3:00 P.M.
Sun.	23rd	CENTRAL ARIZ. C & SS—Meeting	2:00 P.M.
Tues.	25th	FLOWER PRESERVERS	9:00 A.M. & 1:00 P.M.
Wed.	26th	CLASS—Desert Trees & Shrubs	2:30 P.M.
Thurs.	27th	LECTURE—Arizona Birds & Animals	3:00 P.M.

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

Vol. XXIX MARCH, 1975 No. 3

REPORT OF THE 28th ANNUAL CACTUS SHOW AND AWARD WINNERS

REG MANNING

SAGUAROLAND BULLETIN

Published and owned by the Arizona Cactus and Native Flora Society, sponsors of the Desert Botanical Garden of Arizona, P.O. Box 5415, Phoenix 85010. Saguaroland Bulletin attempts to promote the Garden and to provide information to the desert plants and their culture. Subscription $5.00 per year, the subscription including active membership in the Society and the Desert Botanical Garden. Issued 10 times a year.

W. HUBERT EARLE, Editor
LILLIAN DIVEN, Associate Editor

Vol. XXIX MARCH, 1975 No. 3

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Best Arrangement, entered by Mrs. A. Frank

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Garden Open Daily 9 A.M.-5 P.M. Including Holidays

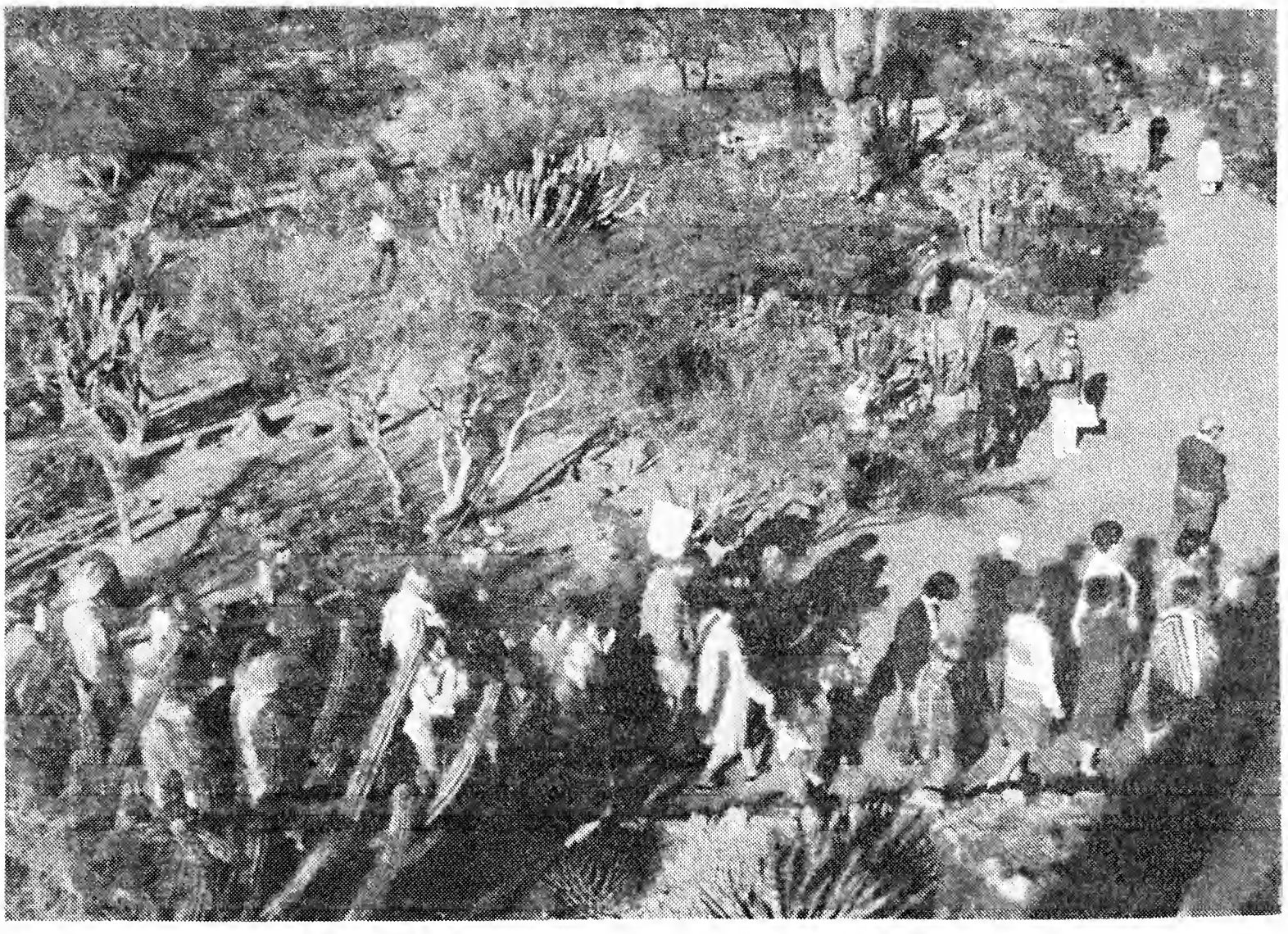
REPORT OF THE 28th ANNUAL CACTUS SHOW

The magnitude of this year's Show continued to amaze us all through the week. Opening day on Sunday, February 16th, brought 3,532 visitors — and with them a traffic jam that needed policemen to un-jam it. Cars were lined up for nearly half a mile, the parking lots were full, and visitors lined up outside the Auditorium to see the Show. All sorts of records were broken that day, and voluntary admissions and sales of merchandise and plants came to over $3,000. Surely, this can't keep up, we thought. But excitement mounted daily as the Staff and Volunteers saw totals climb higher and higher.

We had felt that the energy squeeze and the general economic situation would make for only modest attendance admissions and sales, but by the last hour of the last day of the Show we totaled close to 17,000 attendance and almost the identical number of dollars. This last was a great surprise, since we had forecast a figure closer to half the total attendance.

We attribute the increased attendance to the generous publicity given by our co-sponsor, the Phoenix Gazette, and all the other newspapers in the area, as well as very good coverage by four of the Phoenix television stations.

At first, your Editor was going to say that if you missed the Show you would have to wait for years to see an equally fine exhibition of plants, dish gardens, arrangements, educational exhibits, planters, art and photography, but since every year's show seems somehow better than last year's, next year's Show may well top this one's. It will have to be pretty fine, however.



The 986 entries were a record, and the 135 exhibitors tied 1972's record number. No one has yet totaled the number of different species of cacti and leaf succulents, but the variety was impressive. A record Show in all ways.

The Show was planned and run with the help of all the Staff and 92 volunteers. Work started long before Show Week, and just could not have been done without our Volunteers. During the Show, Volunteers were sales clerks, hosts and hostesses, guides, "policemen", cashiers, tabulators, typists, cooks and bottlewashers. This last group, working with Thelma MacDougall, prepared and served hot lunches to Staff and volunteers every day of the Show, much appreciated in the middle of those very hectic days.

When the Show is over, some people say "Aren't you glad? No more work until next year." It would be nice if we could forget until next year, but that's not the case. As soon as the 1975 Show ended we began, as usual, to plan for the 1976 Show.

One aspect of the Show which receives too little mention is the sale of plants during the Show. We always increase our orders from the growers who supply the small plants we sell regularly at the Shop, but the number of plants for sale is greatly increased by donations of plants from Members who "thin out" their own gardens to supply us with material. For many members of the public the plant sale is nearly as important as the Show, and for the Garden this sale of donated plants is a definite financial bonus.

Members who gave of their own plants for this event include:

Mrs. Richard Enz, Helen Friedrichs, Phil and Frank Hennessey, Agnes M. Holst, Louis H. Knaak, J. Harry Lehr, Betty Lewin, Clayton McGowan, Salvatore Macri, Bob Moulis, Mr. and Mrs. George Probert, Mr. and Mrs. Fred Starbuck, C. L. Thomson, Frances Thorp, Lela Turner and Floyd Wickenkamp.

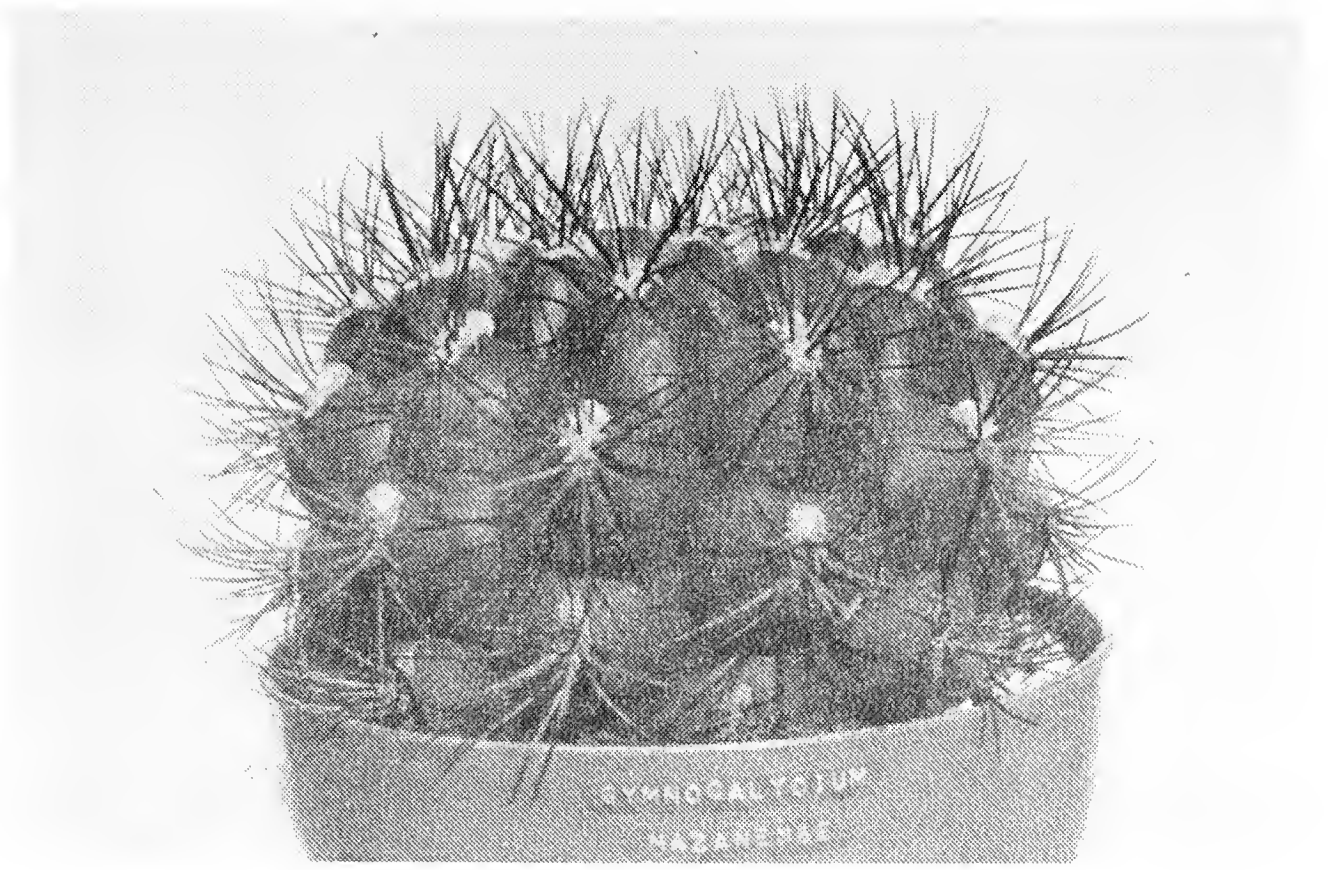
And now the Garden would like to give its warmest thanks to these fine Volunteers whose work before and during the Show was fundamental to its success:

Janet Alsever, Khrybel Amberg, George Andersen, John Barron, Fred (our photographer) and Wilma Baselt, Sandra Brazel, L. Bremer, Margaret Caldwell, Mrs. Joe S. Carson, Martha Chester, Catherine Clore, Vi and Raymond Colepaugh, Lillian Diven, Elizabeth and Wes Cook, Warner Dodd, Lucile Earle, John Earle, Neola Eyer, Genevieve Evans, Alice Feffer, Audrey and Lawrence Ferguson, Elizabeth Fritz, Helen Friedrichs.

Mary Getz, Peg Gill, Walter Groll, Eleanor and Carl Groschke, Chester Groseclose, Mary Hale, Roger Hawk, Phil and Frank Hennessey, Isabelle and Art Holt, Nevelyn and John Hopkins, Mildred Hunt, Margaret and Becky Jenkins, Margaret Kaduck, Elsa and Elmer Kraatz, Bernard Lewin, William Lewis, Sarah Lynn, Thelma McDougall, Ann McGill, Barbara and Charles Merbs and their daughters Shannath and Heather, Helen Mitchell.

Penny Naumoff, Angeline Nicosia, Rena and John Norviel, Genevieve Oppen, Dorothy O'Rourke, Harold Ousby, Martha Passwater, Alice and Wendell Phillips, Bea Platt, LaMont Potter, Rachel Pruet, Rosebud Rudolph, Evelyn Sabye, Betty and Ed Schrieber, Marcia Schaffer, Fran Shellington, Joan Skirvin, Joan Smith, Mr. and Mrs. Fred Starbuck, Lee Staver, Marie Steiger.

Mrs. F. C. Stiles, Fran Tolleson, Henry Triesler, Lela Turner, Demetrios Vlachos, Rheba Wright and Mrs. Stanley Yetter.



Judged the Best Cactus in the Show was this *Gymnocalycium mazanense* entered by William C. Lewis.

TWENTY-EIGHTH ANNUAL CACTUS SHOW AWARD WINNERS

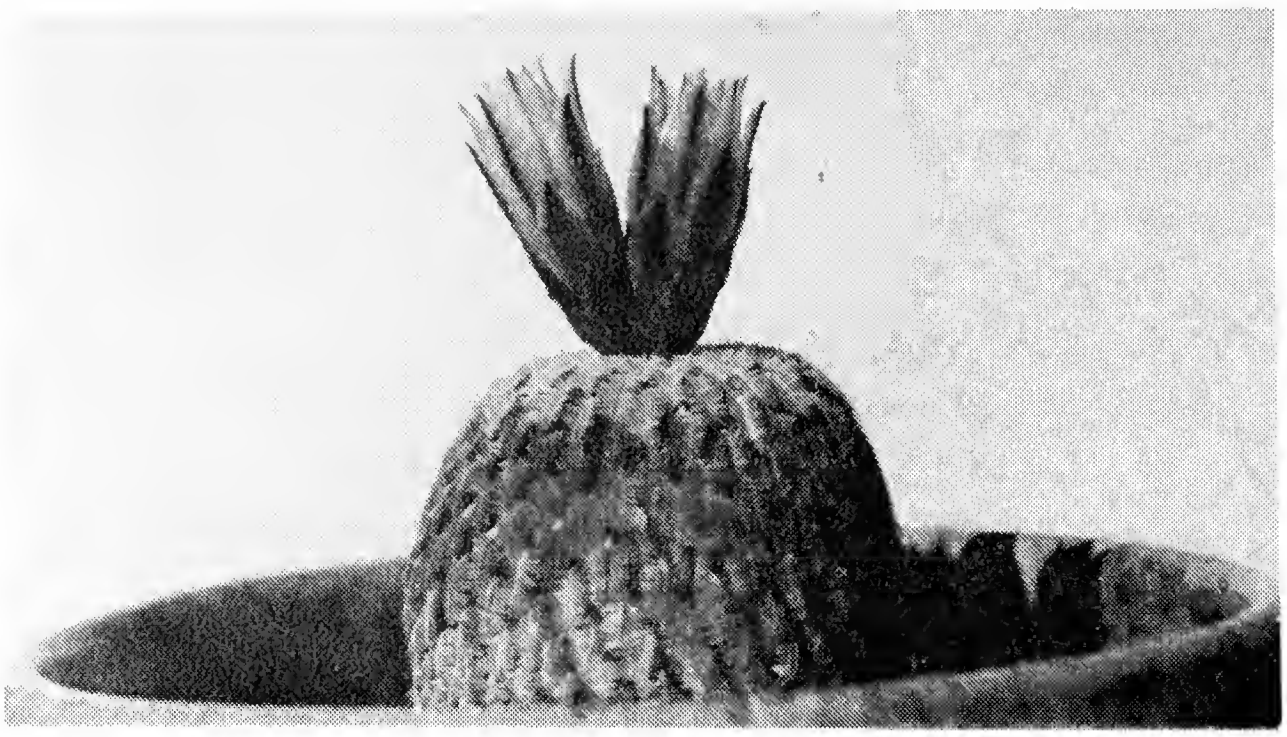
SWEEPSTAKES AWARDS

(Accumulation of the most award points in the specific group)

CACTI: Robert Moulis, 13431 N. 33rd Place, Phoenix
LEAF SUCCULENTS: James A. Robbins, Sierra Vista, Ariz.
ARRANGEMENTS: Mrs. Albert Frank, 5306 N. 9th St., Phoenix

TROPHY AWARDS

CACTUS: William C. Lewis, 2912 E. Flower, Phoenix
MAMMILLARIA: L. Bremer, 11220 N. 105th Ave., Sun City
COLLECTION OF 5 CACTI: Robert Moulis
SEEDLINGS: Charles Merbs, 8408 S. Newberry Ln., Tempe
CRESTED CACTI: Robert Moulis
LEAF SUCCULENT: Genevieve Oppen, 2633 N. Evergreen, Phoenix
COLLECTION OF 5 LEAF SUCCULENTS: Henry C. Triesler, 324 E. Sheridan, Phoenix
DISH GARDEN: Lela Turner, 324 W. Sierra Way, Phoenix
PATIO PLANTER: Genevieve Oppen
DESERT BONSAI: Louis H. Knaak, 6201 Calle Redondo, Phoenix
CENTERPIECE: Lela Turner
ARRANGEMENT AGAINST WALL: Mrs. Albert Frank
MINIATURE ARRANGEMENT: Mrs. Albert Frank



Blue-ribbon winning *Pelecyphora pseudopectinata* entered by Dr. Charles Merbs. It flowered during the Show.

PHOTOGRAPHY — COLOR PRINT: Walter J. Groll, Sr., 4521 W. Orangewood, Glendale
PHOTOGRAPHY—BLACK & WHITE PRINT: Hobart Pribbenow, 3405 E. Sheridan, Phoenix
PHOTOGRAPHY—TRANSPARENCY: Dorothy O'Rourke, 1509 N. 46th St., Phoenix
ART, OILS: Zoraida Twitty, 520 W. Lamar, Phoenix
ART, WATERCOLOR: Ruth Blomeyer, 5716 E. Cactus Wren, Scottsdale
ART, BOTANICAL ILLUSTRATION: Wendy Hodgson, 828 W. 2nd St., Tempe
COMMERCIAL EXHIBIT: J. Whitman Evans, 5221 E. Van Buren, Phoenix

RIBBON AWARD WINNERS

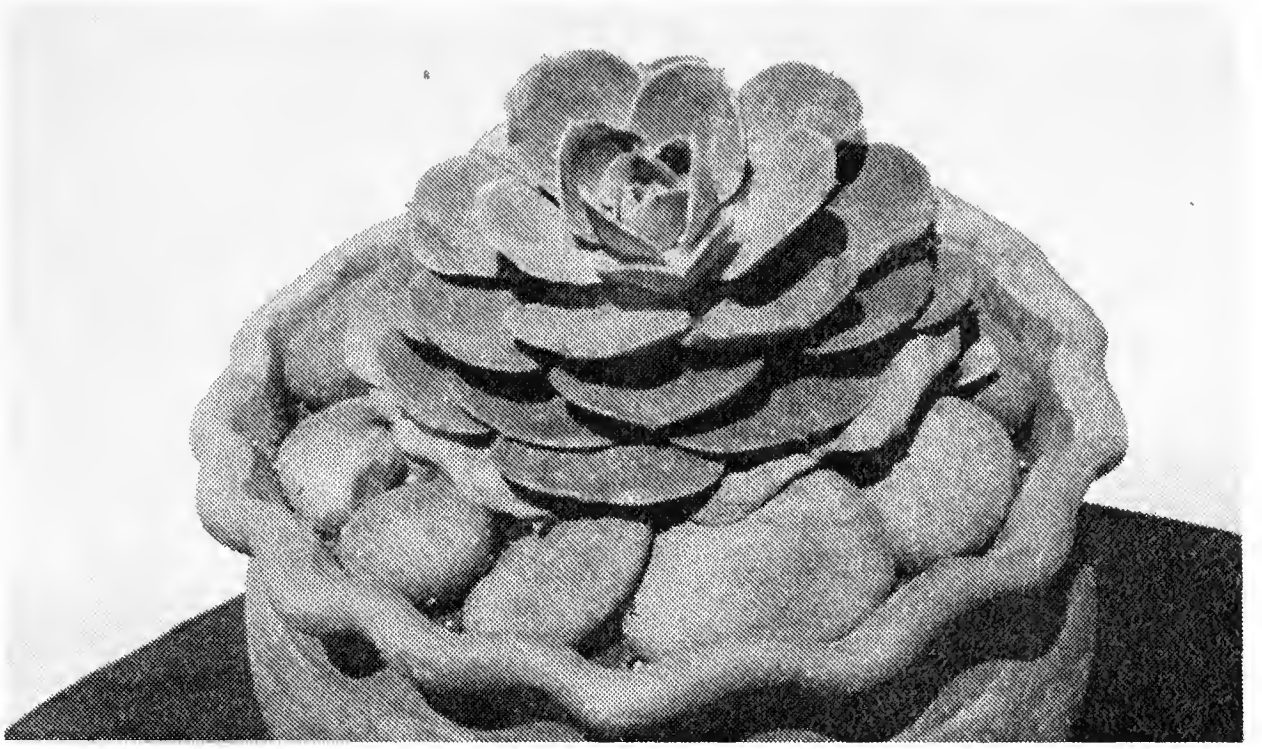
SECTION I, CACTI. CLASS A, INDIVIDUAL POTTED SPECIMENS

1. ARIOCARPUS. 1st, Fran Tolleson. 2nd, R. Moulis. 3rd, L. Bremer. 3rd, Wm. Lewis.
2. ASTROPHYTUM. 1st and 2nd, Fran Tolleson. 1st and 3rd, L. Bremer. 2nd, R. Moulis. 3rd, Emma Oscarson.
3. CEREUS. 1st, Emma Oscarson. 2nd, M. Kaduck. 3rd, P. Hennessey.
4. CHAMAECEREUS. 1st and 3rd, Fran Tolleson.
5. CORYPHANTHA. 1st, P. Hennessey. 2nd, James Robbins. 3rd, L. Bremer.
6. ECHINOCACTUS. 1st, H. Triesler. 3rd, M. Kaduck. 3rd, L. Lugibihl.
7. ECHINOCEREUS. 1st, Emma Oscarson. 2nd, P. Hennessey. 3rd, G. Oppen. 4th, L. Bremer.
8. ECHINOMASTUS. 1st, P. Hennessey. 2nd, R. Moulis. 3rd and 4th, L. Bremer.
9. ECHINOPSIS. 1st, Fran Tolleson. 2nd, Warner Dodd. 3rd, L. Lugibihl.
10. FEROCACTUS. 1st and 2nd, M. Kaduck. 3rd, G. Oppen.
11. GYMNOCALYCIUM. 1st, Wm. Lewis. 2nd, Fran Tolleson. 3rd, C. Merbs.
12. LOBIVIA. 2nd, R. Moulis. 3rd, P. Hennessey.

13-A. MAMMILLARIA (hooked-spine). 1st and 3rd, P. Hennessey. 2nd, G. Oppen. 2nd, R. Moulis. 3rd, Fran Tolleson.

13-B. MAMMILLARIA (milky). 1st, H. Triesler. 2nd, W. Lewis. 3rd, L. Bremer. 4th, Fran Tolleson.

13-C. MAMMILLARIA (other). 1st, L. Bremer. 2nd, R. Moulis. 3rd, E. Oscarson. 3rd, P.



Fran Tolleson entered this Echeveria. The pebbles and the pot rim repeated the curves of the leaves for an outstanding effect.

Hennessey. 4th, Fran Tolleson. 4th, Del Seppanen.
14. NEOPORTERIA. 1st and 2nd, J. Robbins. 3rd, Wm. Lewis.
15. NOTOCACTUS. 1st, Fran Tolleson. 2nd, 3rd and 3rd, Wm. Lewis. 4th, L. Bremer.
16. OPUNTIA. 1st, E. Oscarson. 2nd, R. Pribbenow. 3rd, D. Battiest.
17. PARODIA. 1st and 2nd, G. Oppen. 3rd, P. Hennessey.
18. PEDIOCACTUS. 1st, L. Bremer. 2nd and 3rd, R. Moulis.
19. REBUTIA. 1st and 2nd, P. Hennessey. 3rd. J. Robbins.
20. STENOCACTUS. 1st, Wm. Lewis. 2nd, C. Merbs. 3rd, P. Hennessey. 3rd, M. Kaduck.
21. THELOCACTUS. 1st and 3nd, R. Moulis. 3rd, G. Oppen. 3rd, L. Bremer. 4th, Wm. Lewis.
22. TURBINICARPUS. 1st, R. Moulis. 2nd, Wm. Lewis. 3rd, F. Tolleson.
23. ANY OTHER SPECIES. 1st, F. Tolleson. 2nd, G. Oppen. 2nd, Wm. Lewis. 3rd, P. Hennessey. 3rd, J. Robbins. 4th, E. Oscarson.
24. SEEDLINGS. 1st, C. Merbs. 2nd, J. Robbins. 3rd, B. Carbiener. 4th, R.M. Graham.
25. EPITHELANTHA. 1st and 3rd, F. Tolleson. 2nd and 4th, M. Passwater. 3rd, C. Merbs.
26. PELECYPHORA. 1st, C. Merbs. 2nd and 3rd, F. Tolleson.
27. MELOCACTUS. 1st, R. Moulis. 2nd, R. Pribbenow. 3rd, F. Tolleson.
28. GYMNOCACTUS. 1st and 3rd, R. Moulis. 2nd, P. Hennessey.
29. COPIAPOA. 1st and 2nd, R. Moulis.
30. OBREGONIA. 1st, Wm. Lewis. 2nd, P. Hennessey. 3rd, S. Harris.
31. BORZICACTUS. 4th, J. Robbins.
32. FRAILEA. 1st, 2nd and 4th, J. Robbins.
33. SULCOREBUTIA. 1st and 2nd, J. Robbins.
34. MONOTYPIC GENERA. 1st, P. Hennessey. 2nd and 3rd, J. Robbins.

SECTION I, CACTI. CLASS B, CRESTED
1. OWN ROOT. 1st and 2nd, R. Moulis. 2nd, L. Bremer. 3rd and 3rd, Wm. Lewis.
2. GRAFTED. 1st, 2nd and 3rd, R. Moulis.

CLASS C. MONSTROSE. 1st, F. Tolleson. 2nd, L. Potter. 3rd, P. Hennessey. 4th, Wm. Lewis.

CLASS D, GRAFTED. 1st, 2nd and 3rd, R. Moulis.

CLASS E, COLLECTIONS. 1st, R. Moulis. 2nd, F. Tolleson. 3rd, L. Bremer.

Left: Robert Moulis' winning crested and grafted *Espostoa ritteri*. Right: First prize dish garden entered by Lela Turner.

SECTION II, SUCCULENTS OTHER THAN CACTI. CLASS A, INDIVIDUAL POTTED SPECIMENS.

1. AEONIUM. 1st, Lee Trlak. 2nd, J. Robbins. 3rd, F. Tolleson.
2. AGAVE. 1st, C. Merbs. 2nd, D. Seppanen. 3rd, E. Oscarson.
3. ALOE. 1st and 3rd, G. Oppen. 2nd and 4th, F. Tolleson. 2nd, P. Hennessey. 3rd, E. Oscarson.
4. BROMELIADS. 1st and 3rd, F. Tolleson.
6. CRASSULA. 1st, J. Robbins. 2nd, M. Passwater. 3rd, F. Tolleson.
7. DUDLEYA. 1st, D. Seppanen.
8. ECHEVERIA. 1st, J. Robbins. 2nd, F. Tolleson. 3rd, B. Strandberg.
9. EUPHORBIA. 1st and 2nd, G. Oppen. 1st and 3rd, J. Robbins. 4th, F. Tolleson.
10. GASTERIA. 1st, E. Oscarson. 2nd, J. Robbins.
11. HAWORTHIA. 1st, H. Triesler, 2nd and 3rd, C. Merbs. 2nd and 3rd, J. Robbins.
13. KALANCHOE. 1st and 2nd, F. Tolleson. 3rd, B. Rodriguez.
14. LITHOPS. 1st and 2nd, J. Robbins.
15. MESEMBRYANTHEMUM. 1st and 3rd, F. Tolleson.
16. PLEIOSPILOS. 1st and 2nd, F. Tolleson. 3rd, J. Robbins.
17. SEDUM. 1st, M. Kaduck. 2nd, J. Robbins. 3rd, Melinda Williams.
18. STAPELIA. 1st, B. Strandberg. 2nd, K. McComas. 3rd, J. Robbins.
20. ANY OTHER SPECIES. 1st, H. Triesler. 2nd, B. Strandberg. 3rd and 3rd, M. Passwater. 4th, G. Oppen.

Left: Crested *Monvillea spegazzinii* entered by Wm. Lewis. Right: Genevieve Oppen showed this *Cotyledon reticulata* and won a prize.

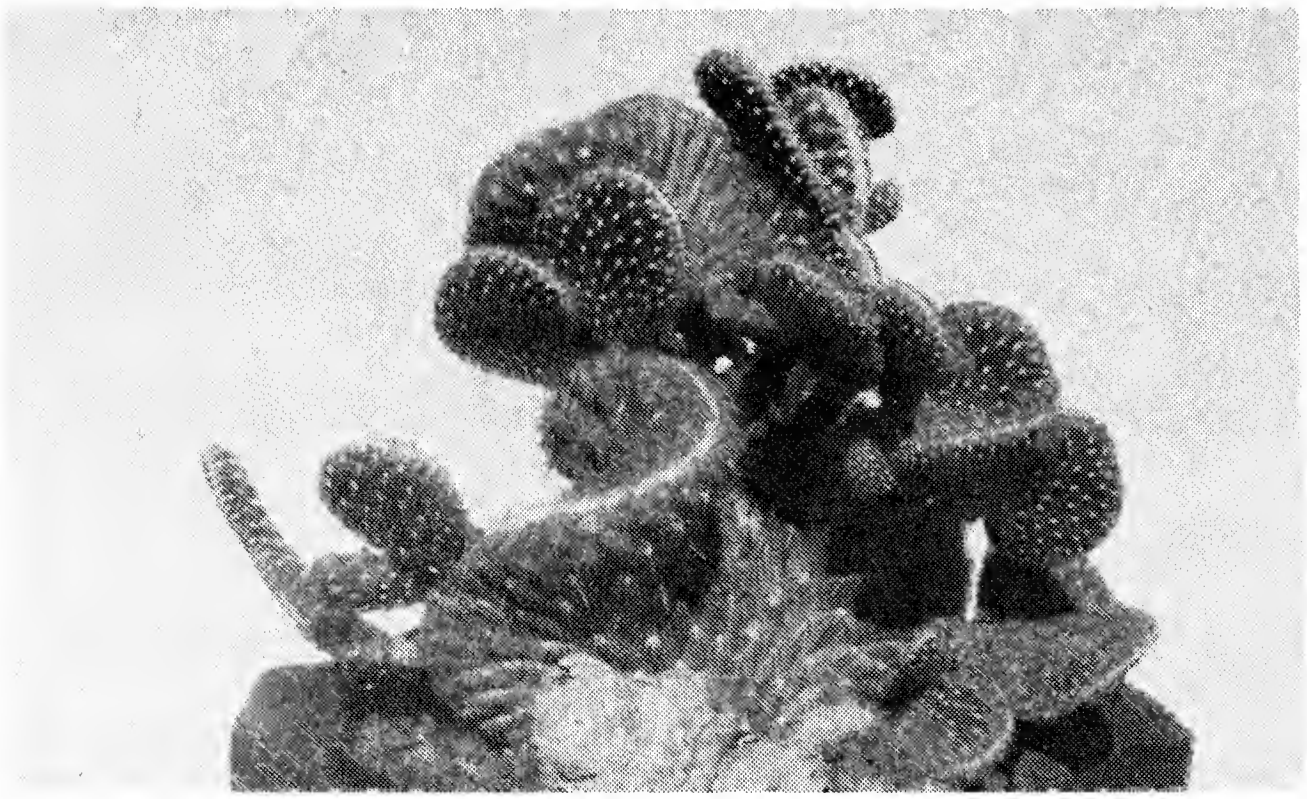
21. SEEDLINGS. 1st, C. Merbs. 2nd and 3rd, J. Robbins.
22. SENECIO. 1st, G. Oppen. 2nd, F. Tolleson. 3rd, B. Strandberg.
23. ANDROMISCHUS. 1st and 3rd, F. Tolleson. 2nd and 2nd, J. Robbins.
24. FAUCARIA. 1st and 4th, F. Tolleson. 2nd and 3rd, M. Passwater.
25. ANACAMPSEROS. 1st, and 2nd and 3rd, J. Robbins.
26. GRAPTOPETALUM. 1st, 2nd and 3rd, J. Robbins. 4th, Isabelle Holt.
27. COTYLEDON. 1st, G. Oppen. 2nd, J. Robbins. 3rd, M. Passwater.
28. CRASSULA HYBRIDS. 1st, 2nd and 3rd, J. Robbins.
29. HUERNIA. 1st, 2nd and 3rd, J. Robbins.
30. MONOTYPIC GENUS. 1st, 2nd and 3rd, J. Robbins.
31. CHEIRIDOPSIS. 1st and 3rd, J. Robbins.
32. CONOPHYTUM. 1st, 2nd and 3rd, J. Robbins.
33. DINTERANTHUS. 1st, 2nd and 3rd, J. Robbins.
34. GLOTTIPHYLLUM. 1st, G. Oppen. 2nd and 3rd, J. Robbins.
35. MITROPHYLLUM. 1st and 2nd, J. Robbins.
36. OPTHALMOPHYLLUM. 1st and 2nd, J. Robbins.
37. TITANOPSIS. 2nd, 3rd and 4th, J. Robbins.

CLASS B, COLLECTIONS. 1st, H. Triesler. 2nd, J. Robbins. 3rd, F. Tolleson. 4th, M. Passwater.

SECTION III. DESERT TREES AND SHRUBS
CLASS A, TREES. 1st, L. Earle. 2nd, C. Bittiker

CLASS C, DESERT BONSAI. 1st, L. Knaak. 2nd, L. Potter.

SECTION IV-A, PLANTERS
CLASS A, DISH GARDENS.
1. CACTI. 1st, E. Oscarson. 2nd, D. Battiest. 3rd, L. Turner. 4th, L. Lugibihl.



Emma Oscarson's crested Opuntia was one of the most attractive "Boxing Glove Cactus" plants entered in the Show.

2. OTHER SUCCULENTS. 1st, F. Tolleson. 2nd, E. Oscarson. 3rd, B. Rodriguez. 4th, L. Turner.
3. CACTI & OTHER SUCCULENTS. 1st, L. Turner. 2nd, F. Tolleson. 3rd, E. Oscarson. 4th, Jacqueline Evans.

CLASS B, TERRARIUMS. 1st and 2nd, F. Tolleson. 3rd, Mrs. R. Enz.
CLASS C, HANGING BASKETS. 1st and 3rd, F. Tolleson. 2nd, B. Strandberg.
CLASS D, STRAWBERRY JARS. 1st, D. Seppanen. 2nd, L. Earle. 3rd, P. Hennessey.
CLASS E. PATIO PLANTERS. 1st, G. Oppen. 2nd, D. Battiest. 3rd, L. Lugibihl. 4th, Mrs. E. Macri.

SECTION IV-B, ARRANGEMENTS
CLASS A, CENTERPIECES.

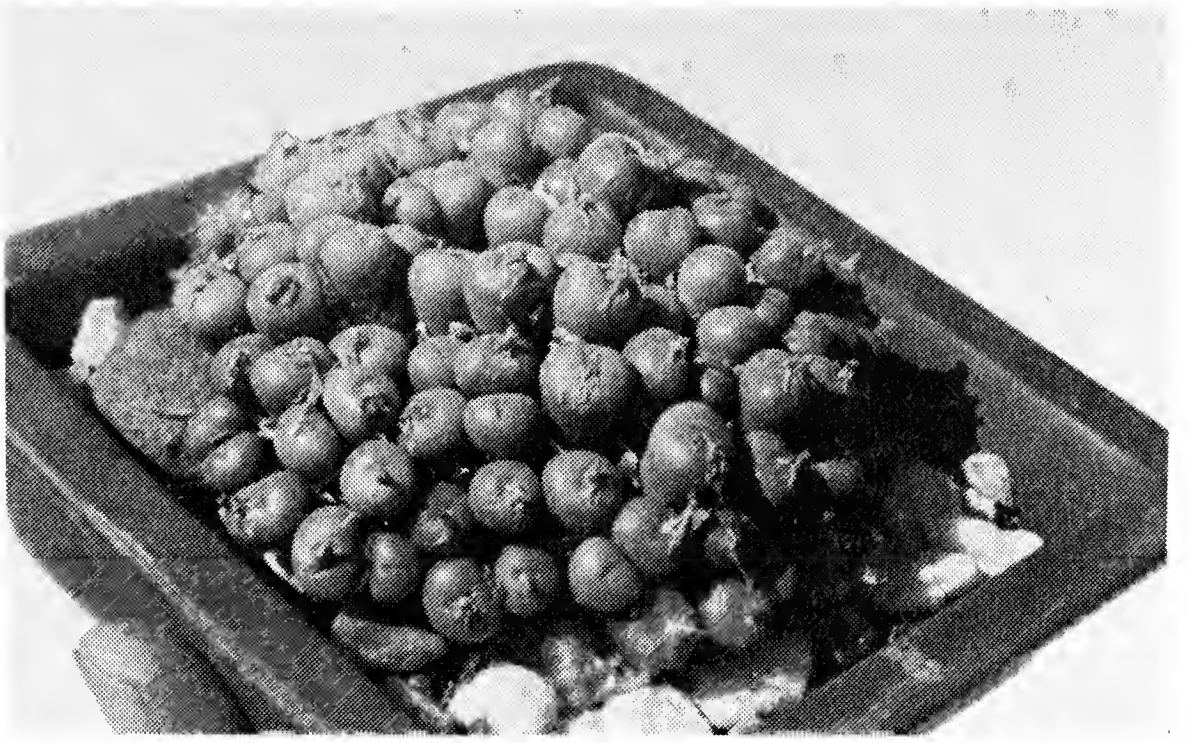
1. CACTI. 1st, L. Turner.
2. SUCCULENTS. 1st, L. Turner.
3. CACTI & SUCCULENTS. 1st, L. Turner.
4. DRIED ARIZONA DESERT MATERIAL. 1st, Timmy Nance. 2nd, Betty Lewin. 3rd, B. Strandberg. 4th, E. Schrieber.
5. SOUTHWESTERN THEME. 3rd, Judy F. Smith.

CLASS B, ARRANGEMENTS ON OR AGAINST WALL.

1. CACTI. 1st, Mrs. A. Frank. 2nd, E. Oscarson, 3rd, L. Turner.
2. SUCCULENTS. 1st, B. Strandberg. 2nd, E. Oscarson.
3. CACTI & SUCCULENTS. 1st, Mrs. A. Frank. 2nd, L. Turner. 3rd, E. Oscarson.
4. DRIED ARIZONA DESERT MATERIAL. 1st, Mrs. A. Frank. 2nd, B. Strandberg. 3rd, E. Oscarson.
5. SOUTHWESTERN THEME. 1st, Mrs. A. Frank. 2nd, L. Lugibihl. 3rd, E. Schrieber.

CLASS C, CORSAGES.

2. SUCCULENTS. 1st, Mrs. A. Frank.
4. DRIED ARIZONA DESERT MATERIAL. 1st, Mrs. A. Frank.
5. SOUTHWESTERN THEME. 1st, Mrs. A. Frank.



James A. Robbins' *Conophytum minutum* var *minutum*, a winner, had over fifty small "beads" in a four-inch pot. This was a single plant.

CLASS D, BUTTON ARRANGEMENTS.

1. CACTI. 1st, Mrs. A. Frank. 2nd, B. Rodriguez.
2. SUCCULENTS. 1st, Mrs. A. Frank. 3rd, B. Rodriguez.
3. CACTI & SUCCULENTS. 2nd, B. Rodriguez.
4. DRIED ARIZONA DESERT MATERIAL. 1st, Mrs. A. Frank. 2nd, B. Strandberg. 3rd, E. Schrieber.
5. SOUTHWESTERN THEME. 1st, Mrs. A. Frank. 3rd, B. Rodriguez.

CLASS E, MINIATURE ARRANGEMENTS.

1. CACTI. 3rd, E. Schrieber.
2. SUCCULENTS. 2nd, Mrs. A. Frank. 3rd, E. Schrieber.
3. CACTI & SUCCULENTS. 2nd, Mrs. A. Frank.
4. DRIED ARIZONA DESERT MATERIAL. 1st, B. Strandberg. 2nd, Mrs. A. Frank. 3rd, L. Lloyd.
5. SOUTHWESTERN THEME. 1st, Mrs. A. Frank. 3rd, E. Schrieber.

SECTION V, PHOTOGRAPHY

CLASS A, BLACK & WHITE PRINTS. Landscapes: 1st, Hobart Pribbenow. 2nd, Jack Hallen. 3rd, Walter J. Groll, Sr. Wildlife: 1st, John H. Walter. 2nd,Jack Hallen. 3rd, Ken Kingsley. Plants: 1st, Hobart Pribbenow. 2nd and 3rd, Agnes M. Holst.

CLASS B, COLOR PRINTS. Landscape: 1st and 2nd, Walter J. Groll, Sr. 3rd, Greg Hyland. Wildlife: 1st, Margaret Kurzius. 2nd, Ken Kingsley. Plants: 1st, Walter J. Groll, Sr. 2nd, Ken Kingsley. 3rd, Bruce Most.

CLASS C, TRANSPARENCIES. Landscapes: 1st, Dorothy O'Rourke. 2nd, Ken Kingsley. 3rd, Dorothy O'Rourke. Honorable Mentions, Olivine Cochrane & Ann Houdek. Wildlife: 1st, Frances Shellington. 2nd, Ken Kingsley. 3rd, Margaret Kurzius. Honorable Mentions, John H. Walter & Frances Shellington. Plants: 1st, Frances Shellington. 2nd, Olivine Cochrane. 3rd, M. Genevieve Evans. Honorable Mentions, Alois Maag, Walter Schulze & Frances Shellington.

SECTION VI, ARTS, DESERT SUBJECTS

CLASS A, OILS. 1st, Zoraida Twitty. 2nd, Virginia McDavid. 3rd, Bernadine Bowen. Honorable Mention: Joan Skirvin, Betty Lange, Beulah Kramer, Frankie Beckham.

CLASS B, WATERCOLORS. 1st, Ruth Blomeyer. 2nd, Harriett Mularz. 3rd, Donald W. Hutton. Honorable Mention: Libby Magnus, Cyril Magnus, Isabelle Holt, Maryl Henes, Jeanette Madden.
CLASS C, ACRYLICS. 2nd, Libby Magnus. 3rd, Siri S. Heeb.
CLASS D, GRAPHICS. 1st, Barbara Hovatter. 2nd, Margaret Kurzius. 3rd, Carl L. Wiehe. Honorable Mention: Barbara Hovatter, Rena Norviel, Margaret Kurzius.
CLASS E, OTHER MEDIA-MIXED MEDIA. 1st, Denyll Darius. 3rd, Aileen Masters.
CLASS F, BOTANICAL ILLUSTRATION. 1st, Wendy Hodgson. 2nd, Barbara Hovatter. 3rd, Margaret Kurzius. Honorable Mention: Barbara Hovatter, Wendy Hodgson.
CLASS G, SCULPTURE. 1st and 2nd Judy Fernyhough Smith. 3rd, Andrew Blomeyer.
CLASS H, HANDICRAFTS. 1st, Judy Fernyhough Smith. 2nd, Lisa Lloyd. 3rd, John Pikula. Honorable Mention: Lillian Lugibihl.
CLASS J. DESERT WOODS. 1st, Mrs. C. H. Morris.

SECTION VII, EDUCATIONAL EXHIBITS
1st, Bernard Lewin. 2nd, L. Earle.

GARDEN ACTIVITIES

FIELD TRIPS: Saturday, April 5th: Oak Flats, east of Superior, 85 mi. from Garden. Easy walking. See oak-chaparral vegetation.

Saturday, May 1: Mingus Mountain, near Jerome. 110 mi. from Garden. Easy, one-mile hike. See spring flowering, pine forest, meadows.

FLOWER PRESERVATION CLASSES begin Tuesday, March 11. Through April 8th. Call the Garden for registration now. Class size limited.

MARCH

Sat.	1st	FIELD TRIP—Seven Spring	8:30 A.M.
Tues.	4th	FLOWER PRESERVERS	9:00 A.M. & 1:00 P.M.
Tues.	4th	CACTOMANIACS—Meeting	8:00 P.M.
Wed.	5th	CLASS—Desert Plants	2:30 P.M.
Thurs.	6th	LECTURE—Arizona Cacti in Flower	3:00 P.M.
Tues.	11th	FLOWER PRESERVERS	9:00 A.M. & 1:00 P.M.
Wed.	12th	CLASS—Succulent Plants	2:30 P.M.
Thurs.	13th	LECTURE—Arizona Wildflowers	3:00 P.M.
Tues.	18th	FLOWER PRESERVERS	9:00 A.M. & 1:00 P.M.
Wed.	19th	CLASS—Culture of Succulent Plants	2:30 P.M.
Thurs.	20th	LECTURE—Arizona Trees & Shrubs	3:00 P.M.
Sun.	23rd	CENTRAL ARIZ. C & SS—Meeting	2:00 P.M.
Tues.	25th	FLOWER PRESERVERS	9:00 A.M. & 1:00 P.M.
Wed.	26th	CLASS—Desert Trees & Shrubs	2:30 P.M.
Thurs.	27th	LECTURE—Arizona Birds & Animals	3:00 P.M.

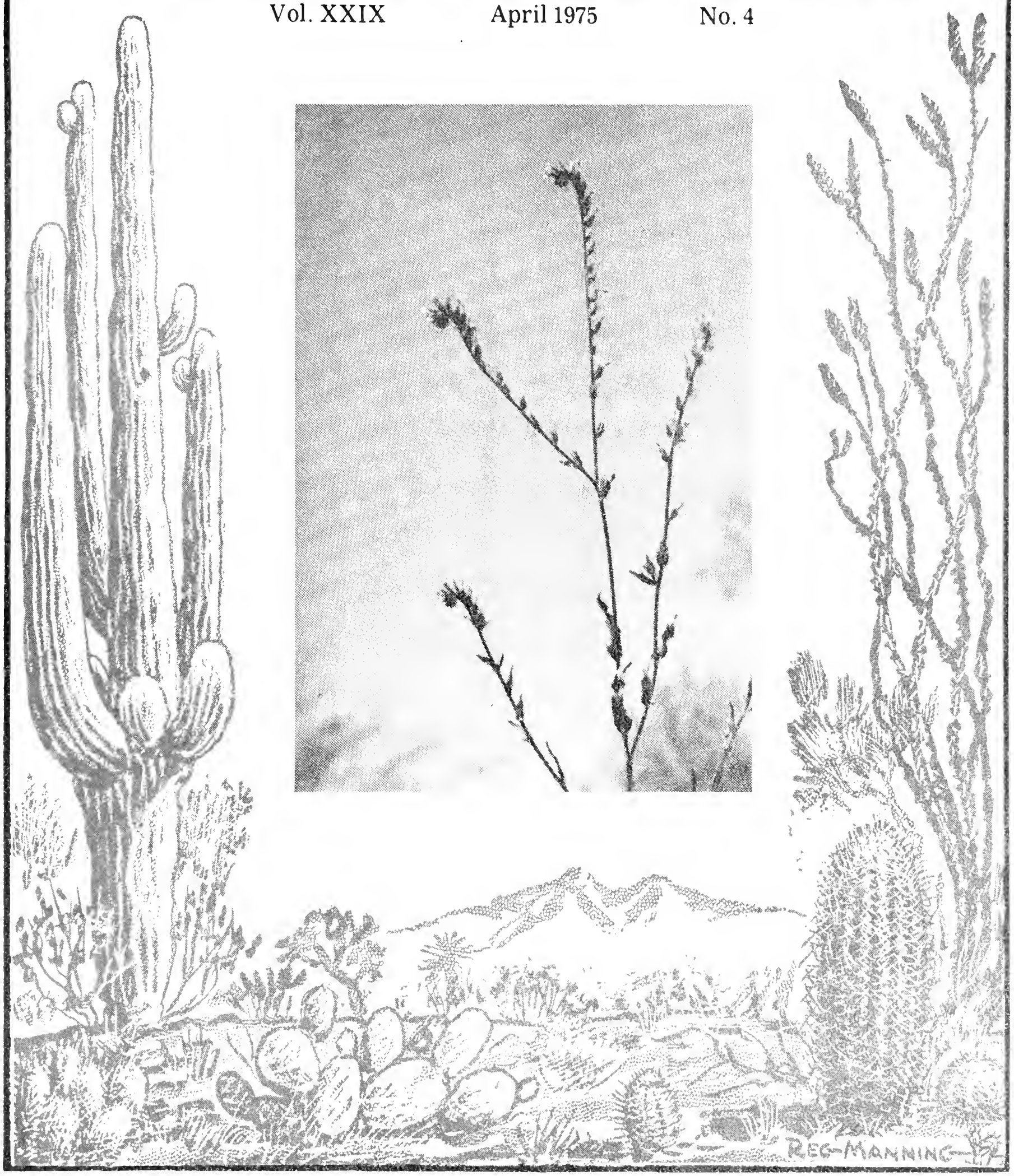
APRIL

Tues.	1st	FLOWER PRESERVERS	9:00 A.M. & 1:00 P.M.
Tues.	1st	CACTOMANIACS	8:00 P.M.
Wed.	2nd	CLASS—Culture of Desert Trees & Shrubs	2:30 P.M.
Thurs.	3rd	LECTURE—Arizona Scenics	3:00 P.M.
Sat.	5th	FIELD TRIP—Oak Flats	8:30 A.M.
Tues.	8th	FLOWER PRESERVERS	9:00 A.M. & 1:00 P.M.
Wed.	9th	CLASS: Desert Trip—Usery Mountains	8:30 A.M.
Thurs.	10th	LECTURE—Arizona Cacti in Flower	3:00 P.M.
Thurs.	17th	LECTURE—Arizona Wildflowers	3:00 P.M.
Thurs.	24th	LECTURE—Arizona Trees & Shrubs	3:00 P.M.
Sun.	27th	CENTRAL ARIZ. C & SS—Meeting	2:00 P.M.

SAGUAROLAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

Vol. XXIX April 1975 No. 4



SAGUAROLAND BULLETIN

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W. HUBERT EARLE, Editor
LILLIAN DIVEN, Associate Editor

Vol. XXIX | April 1975 | No. 4

Arizona Cactus and Native Flora Society

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Cover: *Amsinckia intermedia*

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Editor's Notes

"When will the wildflowers bloom?" This is the constant question every year at this time — by letter, by phone, and by people visiting the Garden. The winter rains were sparse this year, and until last week (this is being written in mid-March) we believed that the desert wildflowers would have little reason to show off their colors in appreciable numbers. Poppies began slowly in February, Ocotillos had been timid, and Joshua Trees began to flower in January and then slowed up.

But an unexpected succession of mid-March rains has changed the prospects, and now it looks as if we will have some fine displays of desert color, starting about April 10th and continuing through the month. Trees and cacti should add to the color in the latter part of the month.

We have recently received anonymous contributions that will be used in an extremely important project next summer. It will involve updating our filing cards, an inventory of all Garden plants with reference to the Accession Book, and a compilation of cross-index with one file card on each plant. This project was started in 1948.

The importance of an Accession Book cannot be exaggerated. If plants in a botanical garden are to be used for any kind of scientific study, certain data must be recorded. That data consists of the name of the plant, where obtained, from whom, and date acquired. In order to associate that information with a specific plant, there must be some way of identifying that plant, so each plant is given a permanent number in the Accession Book and a matching label. In effect, the Book is the basic record of every plant in a garden, the most valuable book a garden can possess. Without it a botanical garden becomes just a tourist attraction.

The funds will be used to employ people with botanical background to check that all plants in the Garden have correctly-numbered labels corresponding with the numbers in the Accession Book. After this exacting inventory, one file card will be made out for each plant, giving its present location. If funds are available, we want to use a punch-card system to make the information as accessible as possible to researchers.

With this system, a visiting scientist can accumulate a great amount of information on distribution, forms, etc. that will obviate field trips and lab work in many cases, or point out directions in which botanical work needs to be done.

Will you, too, contribute funds for this scientifically valuable work? Your gifts are tax-deductible, since the Garden is a non-profit educational institution.

At every Cactus Show we have inquiries for dried desert materials to use in arrangements — grasses, seed-pods, etc. W're asking Members to collect such items this summer and fall, bring them to the Garden, and help put them up in saleable amounts for 1976's Show Week. You'd be surprised how many out-of-staters would like to take such materials home.

We also need volunteers to grow small trees, shrubs and other desert plants to be sold at the Show. Now's the time to begin. Ask us for seed of what you'd like to grow. We had a great public response to our sale of the succulent plants you contributed from your garden. Now it's time to think of the 1976 Show.

You might like to know the names of the fine judges who judged this past Cactus Show. For Cactus and Succulents, Ed and Betty Gay of the Cactus & Succulent Society of America. For arrangements, Mrs. S. R. Stephens, Betty Schimek and Althea Staggs, accredited judges from the Valley Garden Clubs. For Photography, Camille Kimse, recently retired owner of Sunland Photo. For arts, Martha Glasco of the Arizona Artists' Guild. Our thanks again for their fine work.

Enclosed with this issue is a returnable ballot which I wish you would mark and return at once. Incumbent Board Members are up for reelection. Space is provided for write-in votes. Be sure to get your ballot in the mail so that it reaches the Garden by May 3rd. The Members' Annual Meeting will be held in the Richter Library on May 4th at 3 p.m. Mark the date on your calendar so you'll be sure to attend the meeting.

Desert Trees and Shrubs

BIGELOW NOLINA
Nolina bigelovii (Torr.) Wats

Agave Family
Agavaceae

The Nolinas are an interesting group containing about 30 species of endemic southwestern United States and Mexican xerophytes. They are related to the Yuccas and Agaves. Nolinas vary in habit from small single-stemmed or caespitose shrubs to small trees. They may easily be distinguished from the yuccas and agaves by their much smaller flowers and the papery-winged fruits, each containing small, spherical, hard seeds. Both Agaves and Yuccas have large flowers, woody capsules or pulpy fruits, and relatively flat triangular or discoidal seeds.

Nolina bigelovii was described from a collection made by C. C. Bigelow in his 1853-1854 Southwest trip. The specific epithet honors the collector. The type was collected on the "fork of the (Bill) Williams River." It is found in western Arizona, southeastern California, Baja California and Sonora, Mexico on hills and in canyons up to 3500 feet. A closely related taxon, **Nolina parryi** Wats, is regarded by some authors as but a subspecies of **N. bigelovii.** It is here referred to under the synonym **N. bigelovii var. parryi** L. Benson. Its type locality is the foothills of Mt. San Jacinto near Palm Springs, California. Its elevational range is as high as 6000 ft. The distribution is essentially the same as for the typical variety. The variety **parryi** has been reported by Trelease as far east in Arizona as Ft. Whipple near Prescott.

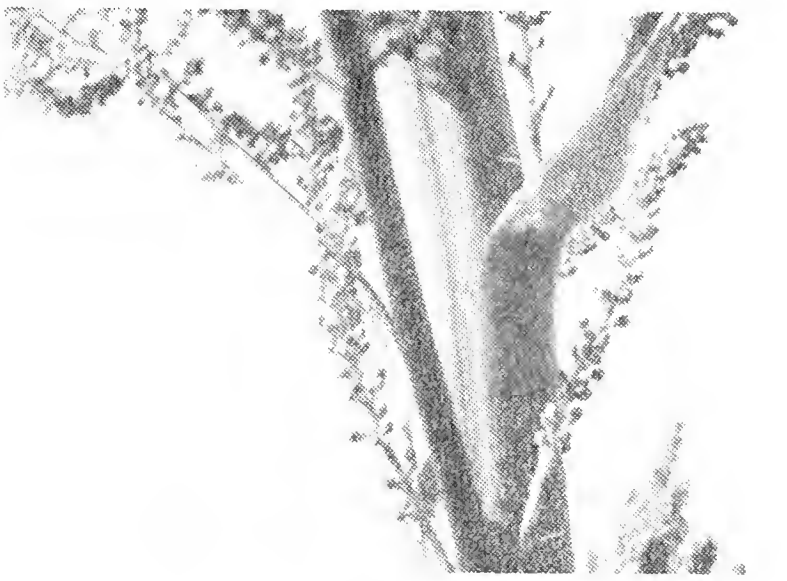
Like all the plants in the Agavaceae the leaves of Nolinas are arranged in rosettes. The leaves are rigid, linear and clustered atop the thick stems in the Bigelow Nolina. They may be extremely robust in variety **parryi**, reportedly exceeding four feet in length. The base of the leaves are expanded and clasp the stem. In the variety **parryi** the leaf margins are serrulate. The leaves are also rather thick, concave and keeled. In the typical variety the leaves are little thickened, concave or keeled. In addition, the margins shred into brown fibers. Intermediate or confusing combinations of these characteristics in populations between Oatman and Kingman and in Grand Canyon National Park have led many to postulate conspecificity for the two taxa.

Nolina bigelovii growing at Indian Spring, Harcuvar Mts.

The thick leaf-covered multiple stems upon which these rosettes grow rise as high as 6 feet from a subterranean or erosion-exposed caudex.

According to Jaeger the axis of the inflorescence may be 12 feet long and 1 ft in diameter at the base. In the usual plant encountered, both these measurements are much reduced. This axis supports a rather compact narrow terminal panicle. The main branches are subtended by long white bracts with deep irregularly-laciniate margins. Pedicels are jointed at the base and subtended by minute scarious bracts. Flowering occurs in May and June. The fruit persists in the inflorescence until late autumn.

The plants are functionally dioecious but a few perfect flowers are usually found in the dense clusters. Panicles also occasionally contain both pistillate and staminate flowers. In such panicles one kind of flower (pistillate or staminate) vastly outnumbers the other. The persistent whitish perianth is divided into 6 single-nerved, distinct elliptic-to-lanceolate segments. The segments are less than 2 inches long. The six stamens have short filaments which are further reduced in pistilate flowers. The sessile, deeply three-lobed ovary has three short curved stigmas on a very short style. The two ovules in each cell are attached basally. Frequently only a solitary light colored subglobose-to-ovoid seed matures in each broadly three winged membranous capsule. The capsules are orbicular in outline, notched at both ends and about 0.7 inches broad. They are tardily locucidally dehiscent or else burst irregularly.



Flowering stem showing white bracts and 12'' pedicels.

Economically, the plants are of little importance. Sheep have reportedly been poisoned from eating the leaves. Indians native to its range formerly used its leaves for plaited basketry and mats. Horticulturally, the plant is little used in Arizona despite its dramatic flowering habit. This is due to its remote natural habitats, the fact that it is protected by law in Arizona, and its long maturation time from seed. Despite these drawbacks it is available from time to time in some of the local nurseries. Requirements for growing this plant are a sunny location, excellent soil drainage, and careful watering in the hot summer months.

REFERENCES

Jaeger, Desert Wild Flowers
Jepson, Manual of the Flowering Plants of California
Munz, A California Flora

—RGE

Arizona Cactus

STAGHORN CHOLLA
Cylindropuntia versicolor
Cactaceae

This is a characteristic cholla of central southern Arizona, growing along with **C. fulgida**, the Chain-fruit cholla, and **C. spinosior**, the Cane cholla and can be readily identified by its purplish stems and bare yellow fruits.

This tree-like cholla will grow up to twelve feet tall and has a spread of fifteen feet in diameter. Its stems are woody and used for fencing, making of novelties and is a fuel of low value but makes a short quick fire.

The flowers are varied in color — hence its specific name of **versicolor**. They are greenish white, yellow up to dark red about two to three inches in diameter having flattened rotate petals.

The fruits are green the first year and mature to a yellow the following year and are two inches long and one inch wide. They often proliferate and hang on several years. They are readily eaten by browsing animals due to the absence of spines and its seeds are eaten by birds and rodents. They are filled with an acrid moisture distasteful to man.

Heavy winds will cause the fruits to fall to the ground where they will root and send up shoots that become branches and then the trunk of the plant.

Plants are found at two to three thousand feet elevations in bottom lands where water is more abundant than on hillsides or mesas and is localized around Tucson and extend southward into Sonora, Mexico.

There are many tree-like chollas with

Cylindropuntia versicolor stem showing yellow bare fruit

the common names like cane cholla, staghorn cholla, elkhorn cholla, jumping cholla, etc. Most of them have formidable spines for their protection against sun and animals.

Cylindropuntia versicolor was first described by Dr. George Engelmann as **Opuntia versicolor** in Coulter's "Contribution to U.S. Nat. Herbarium in 1896". Later it was named **Opuntia arborescens versicolor** in 1904 by E. Dams. Then in 1967 your editor assigned it to the genus **Cylindropuntia** due to its cylindrical characteristic for the aid of botanists and the layman.

Type Locality — Tucson

Distribution — Arizona and northern Mexico

References: Britton & Rose — The Cactaceae

Earle — Cacti of the Southwest

—WHE

ASPECTS OF OUR GARDEN

With this issue we start a series of pictures taken here at the Garden. In the foreground, a number of different Barrel Cacti that can stand our hot desert sun. The low lath shelter behind the visitors shields tenderer Barrels. In the rear, our Visitors' Building and gift shop.

FIELD TRIP TO LITTLE AJO MOUNTAINS

February 1, to Little Ajo Mtns. 40 participants, R. G. Engard, leader. (Plants marked with * were in bloom.)

Phoenix to Ajo:

1. **Brassica tournefortii** along highway. A large-leaved mustard, adventive from Europe, comparatively recent in Arizona and spreading.

2. **Dalea spinosa**, Smoke Tree

3. **Baileya multiradiata***, Desert Marigold

4. **Sphaeralcea ambigua***, Desert Mallow. Normally 2 ft. high, but later on found numerous flowering plants only 1 in. high on slopes of washes.

5. **Baeria chrysostoma***; Goldfields. Just one 5x15 ft. patch.

6. **Erodium cicutarium***, Filaree.

In wash at foot of Little Ajo Mtns.:

7. **Condalia globosa** in fruit. Uncommon shrub, a relict species, sporadic distribution. ¼ in. lvs, fruit ⅛ in. diam., handsome.

8 & 9. **Cercidium floridum** and **Cercidium microphyllum**, Blue and Green Palo Verdes.

10. **Zizyphus obtusifolia**, Graythorn. Used to be called **Condalia lycioides**, now in same genus as jujube tree.

11. **Prosopis juliflora**, Mesquite.

12. **Acacia greggii**, Cat-claw Acacia.

13. **Phoradendron californica**, Mistletoe. Very heavy on some Blue P.V.s

14. **Euphorbia albomarginata**, flat, annual spurge, small, common.

15. **Larrea divaricata***, Creosote Bush

16 17 & 18. **Franseria deltoidea, F. artemesioides**, and **F. dumosa** — Bur-Sages or Ragweeds.

19. **Celtis pallida**, Desert Hackberry.

20. **Lycium andersonii**, Squawberry or Tomatillo

21. **Acacia constricta**, "White-thorn acacia" though thorns may or may not be white, may or may not be present at all. Two bushes, 15 ft. apart, had different colored spines.

22. **Opuntia fulgida**, Chain-fruit Cholla.

23. **Olneya tesota**, Ironwood

In lower hills of Little Ajo Mtns.:

24. **Baccharis sarothroides**, Desert Broom.

25. **Cryptantha sp.***, Popcorn Flower, Small, just starting.

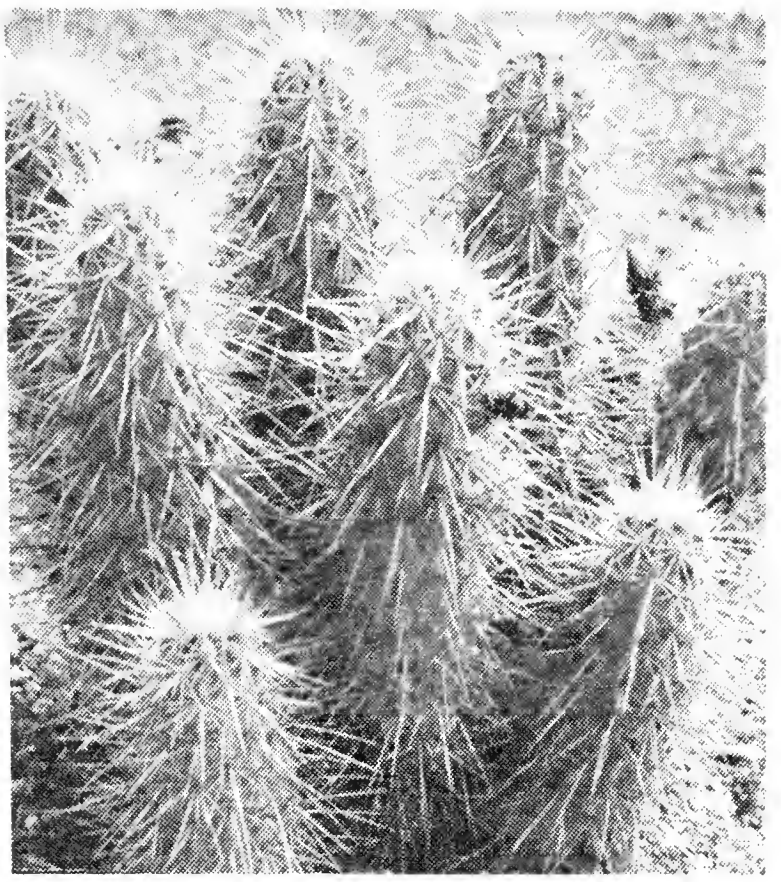
26. **Chorizanthe rigida**, dead, blackened plants about 2½ in. high, look so much like little cacti, hard to believe this is a buckwheat.

27. **Carnegia gigantea**, Saguaro. Large ones but also some 10 in. high.

28. **Lemaireocereus thurberi**, Organ Pipe Cactus, very common, buds beginning to form (above).

29. **Mammillaria microcarpa**, Fishhook, under almost every shrub.

30. **Mammillaria thornberi**, a clustered pincushion.



31. **Echinocereus engelmannii**, Hedgehog, very common (above).

32. **Opuntia leptocaulis**, Christmas Cholla.

33. **Krameria** sp., Ratany, small globular fruit with hooked spines.

34. **Sapium biloculare**, large shrub of Euphorb. Fam., milky sap, poisonous, capsule splits in two ("biloc."). This is one of the Mexican Jumping bean plants. Old leaves sometimes stay on, turn dark red, misleading. Combination of flowers in spikes and milky sap makes this unique in our area for this family.

35. **Atriplex** sp. in fruit.

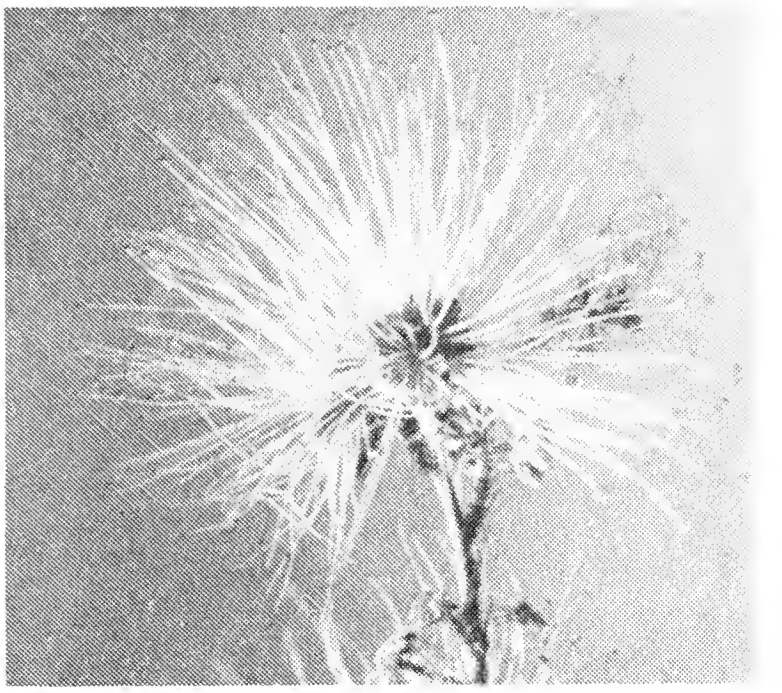
36. **Ferocactus covillei** in fruit. On the sm. ones the spines look as if they encircle body of plant.

37. **Fouquieria splendens**, Ocotillo. One with beer-bottle necks on tips of branches — a new subspecies?

38. **Descurainia** sp.*, Tansy-mustard, common under Creosote and Cat-Claw.

39. **Nama demissum***, Purple-Mat. (One of the pretty "bellyflowers" — you have to get down on your belly to see the little ground-hugging plants — many kinds in the desert.)

40. **Dalea greggii**, this a dense woolly mat.



41. **Calliandra eriophylla, Fairy Duster.** Pink powder puff flwrs later, but not yet (above).

42. **Monoptilon belliodoides**., Desert Star. Lovely little white-into-purple composite, yellow center, an outstanding "bellyflower" growing on hard dry soil, the more you looked the more there were.

43 & 44. **Jatropha cardiophylla** and **J. cuneata,** Sangre de drago — dragon's blood, bec. of red dye from sap. Sources of rubber and basket fibers. Spurge Family.

45. **Porophyllum gracile**, Yerba de venado. Strong odorous leaves & stems — some thought it awful, others not unpleasant.

46. **Dalea parryi***, our third Dalea today, all different sizes, forms.

47. **Hibiscus coulteri***, Mallow family, hibiscus flower white with red center.

48. **Cassia couvesii**, Rattle-pod Senna.

49. **Bursera microphylla,** Elephant Tree. Very handsome specimen of this unusual small tree (common in Baja Calif.) abt 3 ft high, 5 or 6 ft spread. Foliage very aromatic, pleasant. The "Copal Tree" of northern Mexico — source of incense.

50. **Perityle emoryi***, pretty ¾ in. white-rayed flower, a composite.

51. **Eriogonum fasciculatum***, pink-flowered buckwheat.

52. **Phacelia crenulata***, the familiar one we see in bloom 6 wks later in our area.

53. **Lupine** sp.*, just coming into bloom along roads.

—LD

Arizona Wildflower

FIDDLENECK
Amsinckia intermedia
Boraginaceae
Borage Family

It's a safe bet that anyone who has lived here through just one spring has seen this flower. The authorities say it is very abundant on sandy or gravelly soils in the Creosote-bush desert of western and southern Arizona, on hillsides, in valleys and washes, and in disturbed soil — which seems to include just about everywhere. It blooms from February or earlier to June, and is one of the earliest flowers seen on our field trips.

Fiddleneck is easy to find. It is a prolific seeder, and it occurs in small groups, large groups, and wide, solid masses.

It is just as easy to identify. First, the name aptly describes the arrangement of the flowers, a spike that coils back at the top like — well, like a fiddleneck. Secondly, the color is an insistent bright orange-yellow. And thirdly, Fiddleneck obliges with a long blooming period. From the time the bottom flower on the spike appears until the final one at the tip of the coil opens, several weeks go by.

Add to these the fact that the 4-or-5-lobed flower, about ¼ in. long and ¼ in. wide, looks like a forget-me-not, and your identification problem is no problem at all. (There is only one other Fiddleneck in Arizona, **A. tessellata**, but it is much less common, and its flowers are about an inch long.)

The whole plant is covered with stiff, dry hairs — the stems as well as the lance-shaped alternate leaves — and when the plant dies the job of pulling it up by hand is extremely uncomfortable. A member of the Garden's staff would appreciate any hints on how to get those harsh, needly hairs out of his fingers.

How tall is Fiddleneck? The average range is six to sixteen inches, but with plentiful winter rains it can easily grow to three feet.

If you see a "white Fiddleneck," it's probably a Popcorn Flower, **Plagiobothrys**. They look a lot alike.

This plant ranges through western Canada and the United States to central Baja California. In Arizona from Coconino and Mojave counties south to the Mexican border, chiefly in the Creosote-bush belt.

REFERENCES
Armstrong, Field Book of Western Wild Flowers
Kearney & Peeble, Arizona Flora
Shreve & Wiggins, Vegetation and Flora of the Sonoran Desert

LOOK FOR: Small yellow "forget-me-nots," the fiddleneck, hairy leaves and stems; almost anywhere from winter through June.

—LD

FIELD TRIP TO LAKE MOHAVE

A trip on February 8-9 with the Maricopa Audubon Society to Davis Dam at the south end of Lake Mohave on the Colorado River provided a short introduction to Mohave Desert flora.

The Mohave Desert shares many plants with the Sonoran Desert, but with noticeable differences — some plants were very much more common than we are used to finding them here, others very much less common.

Because of the elevation (under 7000 ft.), the river, and the heat-reflecting rocky cliffs, spring begins early in this area. The past winter had only normal rain, yet the numbers and variety of flowers were impressive. Of the 28 plants listed here, only Arrowweed and Screwbean Mesquite were not in flower, and along a 40 ft. stretch of dry wash near Katharine Landing there were 14 different flowers in bloom, including four Evening Primroses.

1. **Oenothera brevipes,** Yellow Cups. All over the place, 1½ in. bright yellow, to 9 in. high spectacular spreads of this along roadsides, cuttings, washes.

2. **Lupinus sparsiflorus,** reddish-blue-flowered Lupine nearly as common but just coming into bloom.

3. **Erodium cicutarium, Filaree.**

4. **Larrea divaricata,** Creosota Bush.

5. **Eriogonum inflatum,** Desert Trumpet, swollen-stem buckwheat.

6. **Plantago insulars,** Indian Wheat.

7. **Encelia farinosa,** Brittlebush.

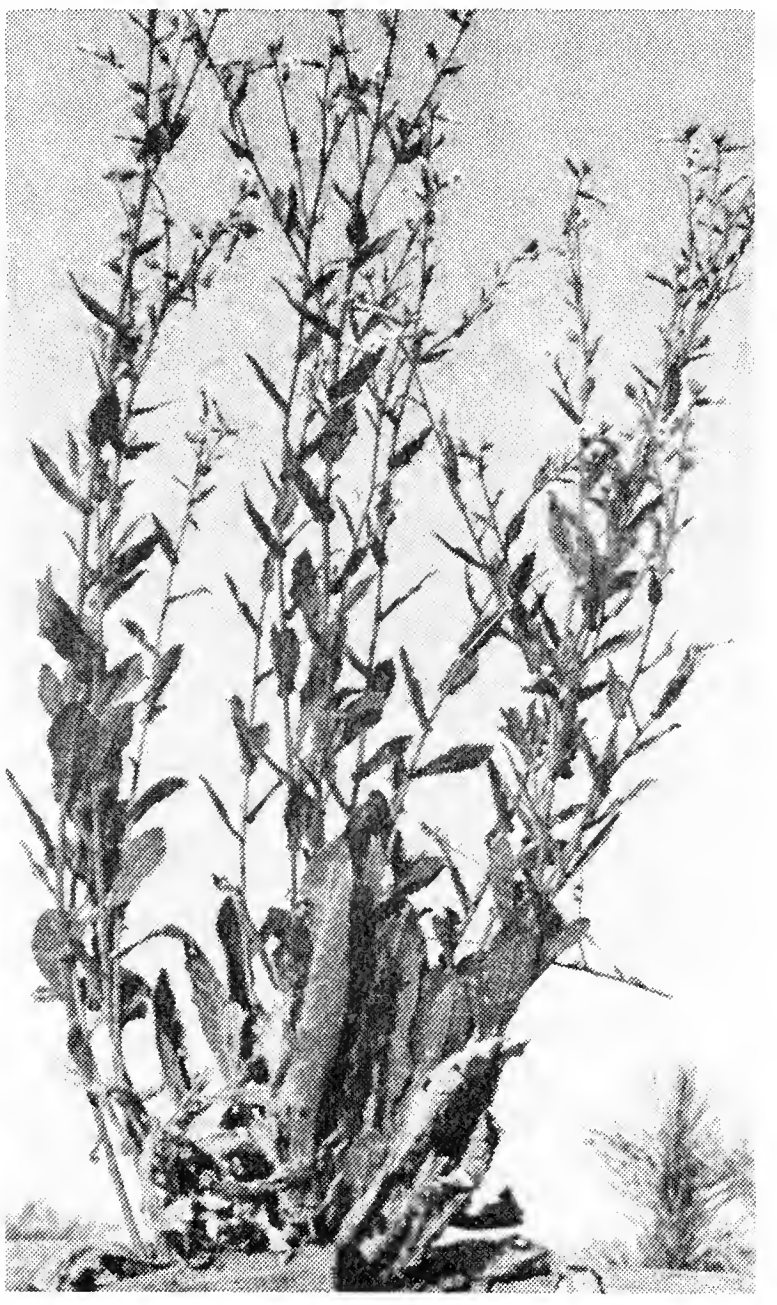
8. **Hymenoclea salsola,** Burro Bush.

9. **Atriplex polycarpa,** most common Saltbush along river. Allscale or Cattle Spinach.

10. **Sisymbrium irio,** Mustard Grass.

11. **Euphorbia sp,** very small, very red spurge.

12. **Plagiobothrys arizonicus,** Popcorn Flower.



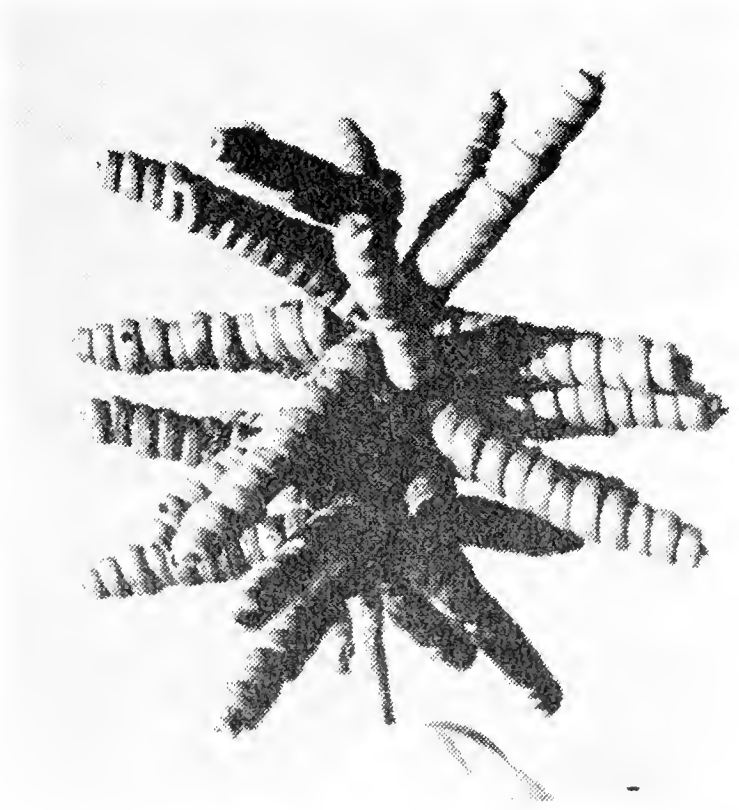
13. **Nicotiana trigonophylla,** Desert Tobacco (above).

14. **Phacelia crenulata,** very purple in one area, bluer in another.

15. **Pluchea serica**, Arrowweed. Extremely common along river, thickets 12 ft. high.

16. **Eriogonum deflexum**, Skeleton Weed. Another buckwheat.

17. **Chrysothamnus sp**, Rabbit Brush, **aromatic.**



18. **Prosopis pubescens**, Screwbean Mesquite. Dominant tree along the Colorado here. Growth habit unlike our Honey Mesquite — slender branches, more upright (pictured to the left).

19. **Eriophyllum lanosum**, small white yellow-centered ground-hugging daisy.

20 21 and 22. Three small-flowered white **Oenotherae** (Evening Primroses), about 6 in. high. A confusing genus. Two later identified as **O. refracta** and **O. clavaeformis.**

23. **Oenothera sp.** with large 2 in. greenish white flowers. Need capsules for identification of Oenotheras, too early for them.

24. **Gilia sp.**, blue.

25. **Amsinckia intermedia**, Fiddleneck.

26. **Chaenactis stevioides**, Pincushion Flower.

27. **Descurainia obtusa**, a small Tansy Mustard.

28. **Oligomeris linifolia**. Cambess. Unobtrusive, small white flowers, our only desert member of the Mignonette Family.

—LD

FIELD TRIPS

Saturday, April 5th, Oak Flats. Nearest town, Superior. 85 mi. from Garden. Easy walking. See oak-chaparral vegetation, spring flowers.

Saturday, May 3rd, Mingus Mountain. Nearest town, Jerome. 110 mi. from Garden. Easy, one-mile hike. See pine forest-meadows.

All field trips leave Garden 8:30 A.M. promptly, return before 5:30 P.M. Bring lunch, wear suitable clothes. Phone Garden at 947-2800 for reservations.

GARDEN ACTIVITIES

APRIL

Tues.	1st	FLOWER PRESERVERS	9:00 A.M. & 1:00 P.M.
Tues.	1st	CACTOMANIACS	8:00 P.M.
Wed.	2nd	CLASS—Culture of Desert Trees & Shrubs	2:30 P.M.
Thurs.	3rd	LECTURE—Arizona Scenics	3:00 P.M.
Sat.	5th	FIELD TRIP—Oak Flats	8:30 A.M.
Tues.	8th	FLOWER PRESERVERS	9:00 A.M. & 1:00 P.M.
Wed.	9th	CLASS: Desert Trip—Usery Mountains	8:30 A.M.
Thurs.	10th	LECTURE—Arizona Cacti in Flower	3:00 P.M.
Thurs.	17th	LECTURE—Arizona Wildflowers	3:00 P.M.
Thurs.	24th	LECTURE—Arizona Trees & Shrubs	3:00 P.M.
Sun.	27th	CENTRAL ARIZ. C & SS—Meeting	2:00 P.M.

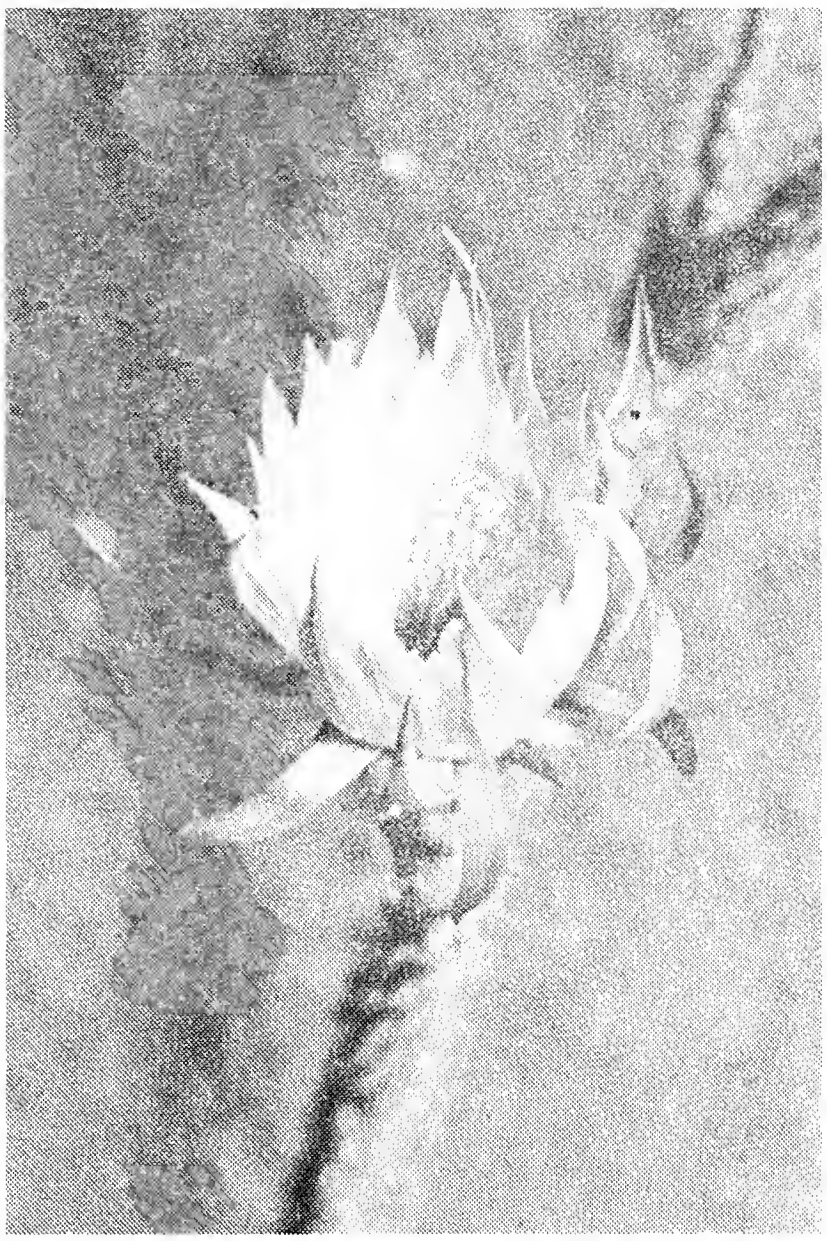
MAY

Sat.	3rd	FIELD TRIP—Mingus Mountain	8:30 A.M.
Sun.	4th	MEMBERS ANNUAL MEETING	3:00 P.M.
Tues.	6th	CACTOMANIACS—Potluck Supper	6:30 P.M.
Sun.	25th	CENTRAL ARIZ. C & SS—Meeting	2:00 P.M.

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

Vol. XXIX May, 1975 No. 5



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W. HUBERT EARLE, Editor
LILLIAN DIVEN, Associate Editor

Vol. XXIX | May, 1975 | No. 5

Arizona Cactus and Native Flora Society

EXECUTIVE BOARD

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Vice President ..... Edward Burrall
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Secretary ..... Angela Bool
Chief Counsel ..... Richard B. Snell

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COVER—Flower of *Peniocereus greggii*, see p. 52

Desert Botanical Garden of Arizona

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Director ..... W. H. Earle
Research Botanist ..... Dr. Howard S. Gentry
Superintendent ..... Rodney G. Engard
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Maintenance & Bookstore ..... Donald C. Shelstad
Student Horticulturist ..... John Moresco, Russ Haughey

Garden Open Daily 9 A.M.-5 P.M. Including Holidays

Editor's Notes

This has been a very cool spring (this being written April 12), and has proved to have had its advantages by allowing cacti flowers to reopen four to five days whereas in the hot weather they open only for one day due to the heat.

Several prolonged showers have caused additional wildflowers to germinate, and others to perk up and show their faces. On several recent field trips we have observed many flowers, but they can only be found by searching for them under rock-ledges, in arroyos, and in areas sheltered from the cold winds. This has been a hide-and-seek situation, but we have been rewarded with some most unusual flowers and plants for our Herbarium.

The Garden's fiscal year is from May 1st to April 30th. This procedure enables the Garden Members to meet May 4th (first Sunday in May) to vote on a slate of incumbent Board Members which will be presented to the Board's Annual Meeting about the middle of May.

Be sure and attend the Members Annual Meeting May 4th to be held in the M. C. Richter Memorial Library to count the mailed-in ballot cards; hear reports of the past years' accomplishments, and prospective projects for the coming year.

The Cactus & Succulent Society of America is holding its 16th Biennial Convention at San Diego May 12-16th at the Bahia Hotel, on Mission Bay Drive.

This meeting will give you the opportunity to meet marvelous cacti and succulent enthusiasts from all over the country; enjoy the hospitality of Southern California Cactus clubs; and be escorted to out-of-the-way cactus and succulent gardens and nurseries. Our Research Botanist, Dr. Howard Scott Gentry, will address the Group May 12th on 'The Man-Agave Symbiosis.'

Additional information can be obtained from members of the Central Arizona Cactus and Succulent Society. You should not miss this opportunity of meeting this fine assembly of fanciers, especially as this meeting is near to Phoenix.

How is your vegetable garden growing? Having trouble with insects? Why not grow a flower-vegetable garden as described in HORTICULTURE, April 1975, which lists some natural insect repellents: grow Dill which acts as a trap for tomato worms; Garlic, Onions, and Chives can repel many insects, and can be made into a spray; Mexican Marigold will repel nematodes, control club roots in Brassica (cabbage, etc.) vegetables and protect cucumbers; Nasturtium will repel asparagus beetle; Turnips can repel aphids, flies, spider mites; White Geranium can repel Japanese beetle; Zinnia can act as a trap for Japanese beetles, and will repel cucumber beetle and tomato worm.

If one member of your family desires a vegetable garden, and another member insists on a flower garden, why not take this opportunity to combine the desires and produce a colorful, attractive "vegeflora"* garden that has produce and flowers.

*coined by your Editor

ARIZONA QUEEN OF THE NIGHT

Peniocereus greggii

A record sized **Peniocereus greggii** was given to the Garden last March by Denny Bradley of Phoenix and was moved into the Garden by our Staff. It is the largest plant we have seen to date and will make a valuable addition and attraction. We most certainly thank Mr. Bradley who claimed the plant had 59 white night blooming flowers in one night — photo of one of the flowers is on the cover.

This enormous tuber was 14″ in diameter 16″ deep and weighed 95 lbs.

This tremendous plant is 52″ in diameter, 30″ tall, has 180 branches and its complete weight is 135 pounds.

OUR LORD'S CANDLE

Yucca whipplei

White flowers are 1½" wide and 3" long.

Yucca whipplei is common on the dry slopes and mesas in the cismontane areas of Southern California down into Baja California, Mexico. It has very narrow leaves 3'-4' long in a dense rosette. This plant was collected north of Santa Barbara by our former botanist, James R. Blakley, as a seedling in 1958. Strangely these lovely yuccas are monocarpic in that they die after flowering thus similar to the same habit of the Agaves.

White bracts 8"-9" adhere to the tall flowering stalk.

Flowering stalks will reach up 14' in height.

FIELDTRIP TO OAK FLATS

On April 5th the Garden's monthly field trip, comprised of thirty visitors and members, left the garden for Oak Flats Recreation Area of Tonto National Forest between Superior and Globe, Arizona. Before leaving the Phoenix area, however, a stop was made in the sandy Salt River channel at about Alma School and McKellips Roads. Here, despite scant winter rains, good stands of **Abronia villosa** (Sand-verbena), **Oenothera claviformis** (a large white flowering, caespitose Evening-Primrose), and **Dithyrea wislizeni** (Spectacle-pod) were seen. Also, on careful observation, many plants of **Nama demissum** (Purple-mat) were found.

From Apache Junction to Florence Junction, bright patches of **Lupinus sparsiflorus**, **Baileya multiradiata** (Desert Marigold), **Sphaeralcea spp.** (Globe Mallows) and **Encelia farinosa** (Brittle Bush) dotted and lined the highway margins.

Between the Queen Creek Tunnel and Superior, scarlet plumes of **Penstemon eatoni** protruded from the cliffs and highway cuts on the south side of the road.

At Oak Flats very little was in flower, but the area offered much in diversity of chaparral zone vegetation. The following were observed:

Rhus trilobata — Skunk or Squaw Bush — formerly used in Indian basketry. Red stone fruits used to make a lemonade-like drink.

Nolina microcarpa — Beargrass or Sacahuista — used in plaited basketry in Southwestern U.S. and Mexico.

Berberis haematocarpa — Red Mahonia or Algerita — berries eaten by wildlife and man. Good jelly and a brilliant yellow dye are obtained from the plants. Fragrant yellow flowers and holly-like foliage distinctive.

Arctostaphylos spp. — Manzanita — small shiny fruits edible, large shrubs forming mounds to 2 meters tall.

Juniperus sp. — Junipers or sometimes erroneously called cedar — berries of some spp. more or less edible but not always palatable. One sp. is the source of flavoring for gin.

Opuntia phaeacantha — Prickly-pear — source of the fruit from which the well-known jelly is made. Many forms.

Quercus arizonicus — Arizona Oak — evergreen tree to 30′, many stunted specimens on coarse rhyolite ledges.

Agave chrysantha — Century plant — one of many spp. of native century plants. Brilliant yellow flowers in June and August. Heads of plants roasted in pits and eaten by Indians, commonly called mescal.

Ceanothus greggii — Ceanothus — one of the earliest flowering species, many spp. commonly used as ornamentals.

Fallugia paradoxa — Apache-plume — a member of the Rosaceae with plumed fruits which resemble our desert Clematis.

Opuntia macrocentra — distinctive bicolored spines more or less restricted to upper third of the joints.

Lonicera sp. — probably sp. **interrupta** — Chaparral honeysuckle — common straggly vine growing in and over shrubs.

Allium sp. — Wild onion — seen in its grasslike, unflowering state, pungent odor of onion readily detectable.

Quercus turbinella — Scrub Oak — a true evergreen oak which makes up a large part of the Chaparral Vegetation.

Rhamnus crocea — Bear-berry — a large glossy-leaved shrub which develops small translucent orange-red berries after flowering. The orange inner bark and berries distinguish this plant from the Scrub Oak which it superficially resembles.

Rhamnus californica — California buckthorn, Coffee-berry or Pigeon-berry — ¼-inch blue-black berries combined with the large entire leaves make this plant easily recognizable.

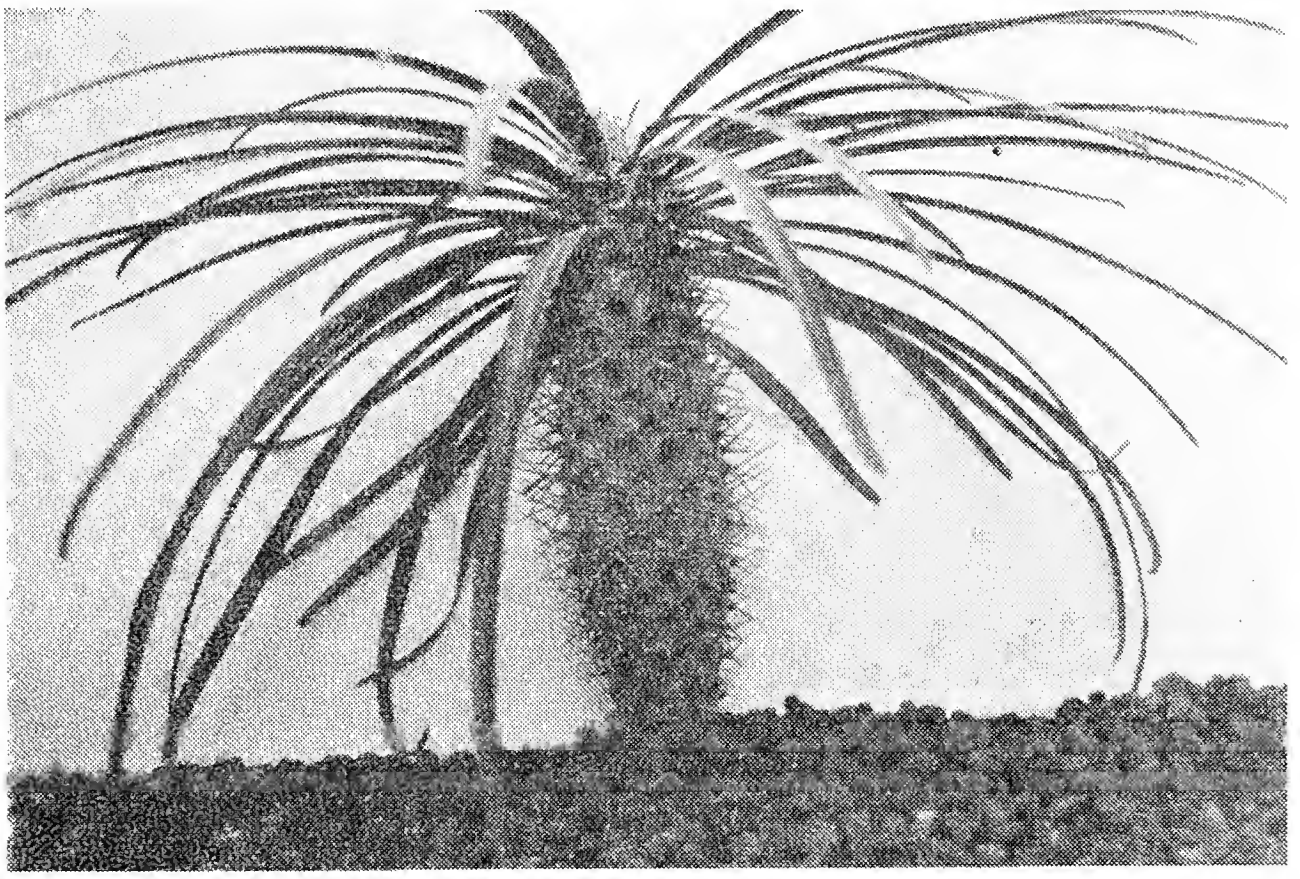
—RGE

ASPECTS OF OUR GARDEN

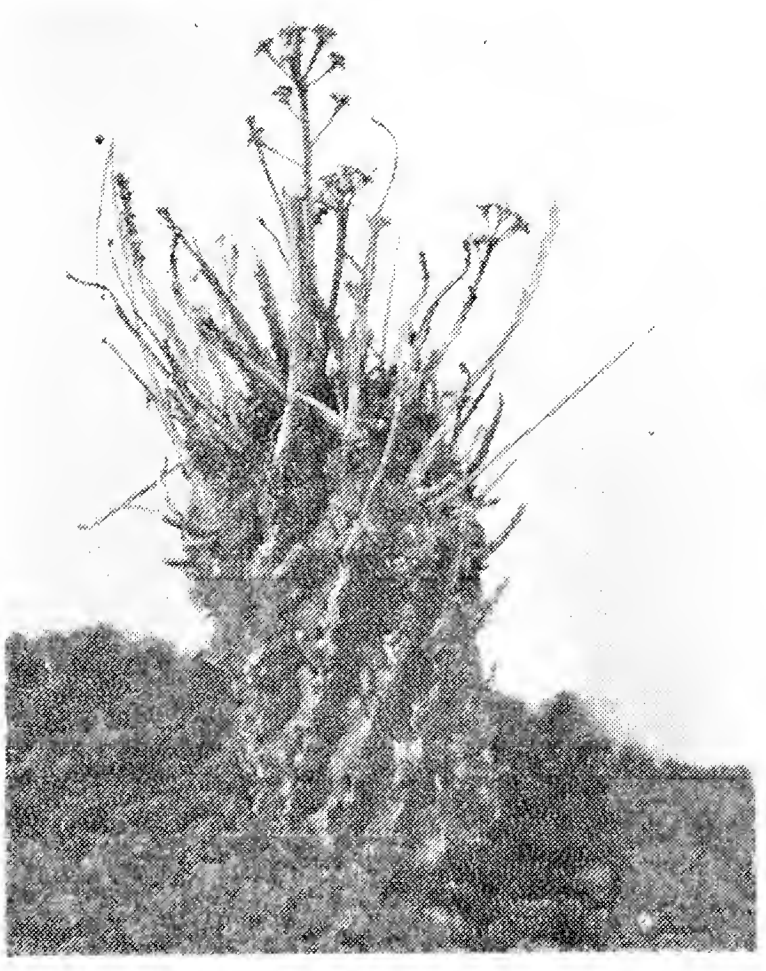
Echinocereus fendleri var. rectispinus is one of the many lovely hedgehog cactus now in bloom through the Garden. They begin to flower in early April through to the middle of June then followed by strawberry-like fruits but densely covered with spines. The plants are found naturally in desert grasslands of S-E Arizona from the Santa Catalina Mts. eastward to New Mexico border then southward into Mexico.

NEW PLANTS IN THE GARDEN

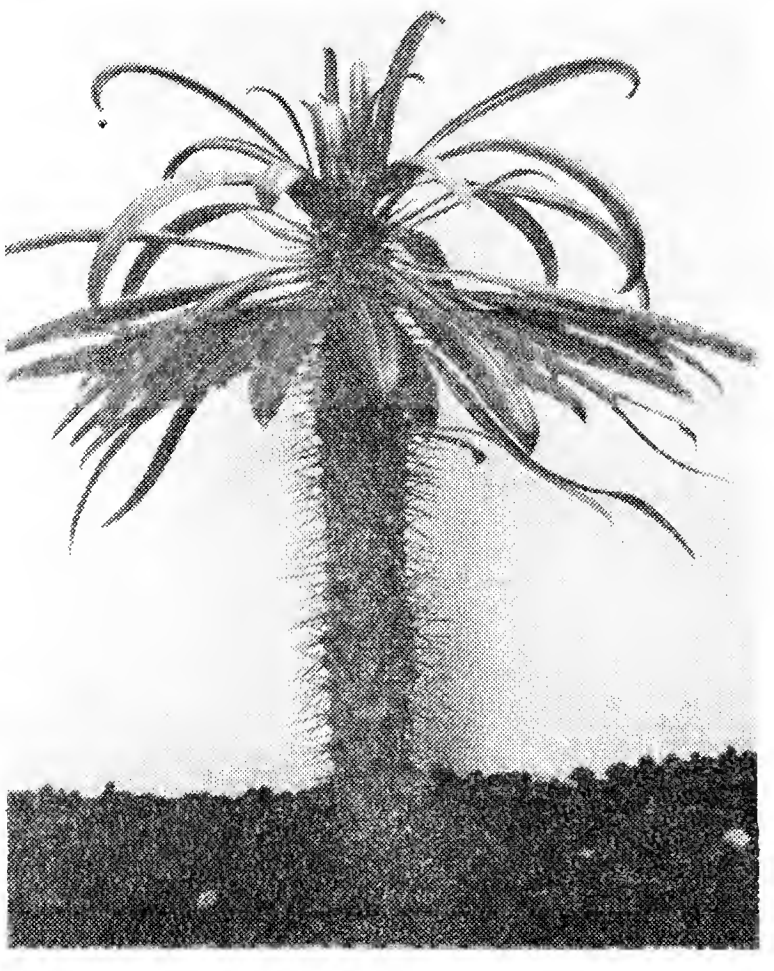
The Garden has been most fortunate to be able to obtain and introduce 34 new rare plants through the Dr. Clifford M. Schroeder Trust Fund for new plants. These were obtained from the Abbey Garden, Carpenteria, Ca., who have collectors throughout the world. Some are shown below and the following page.



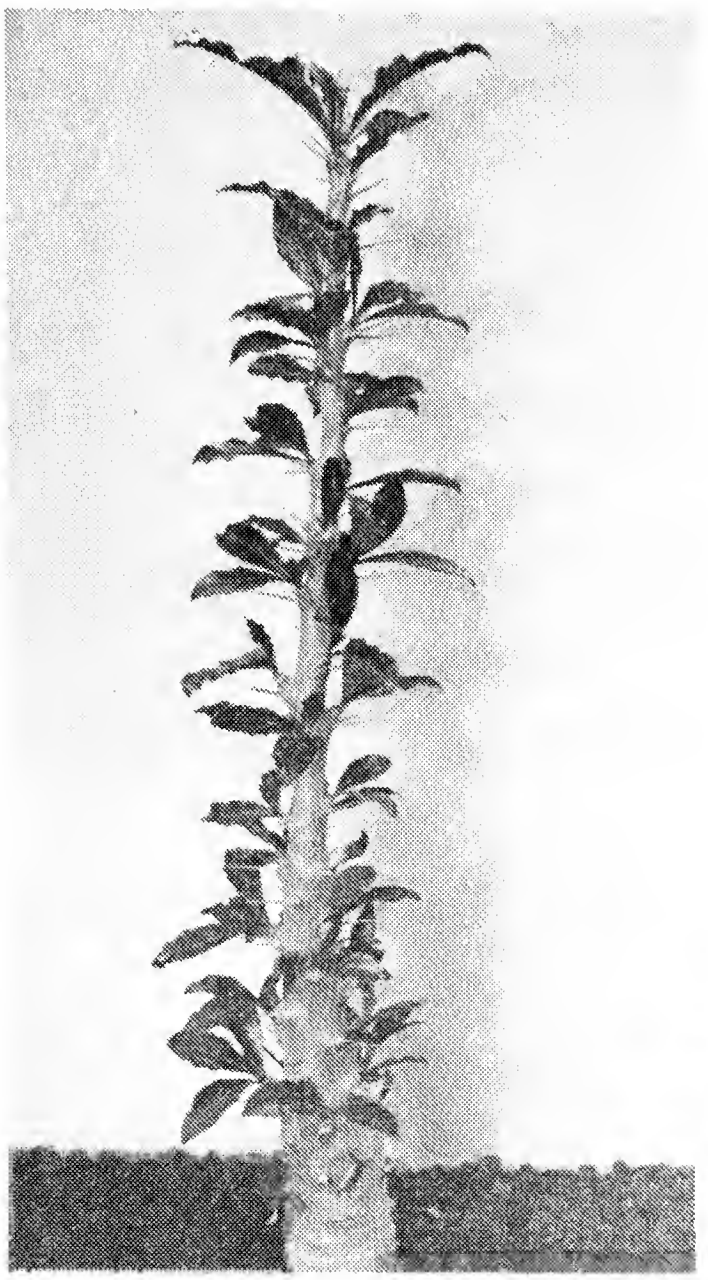
Pachypodium gaeyi — Madagascar



Euphorbia fasciculata — South Africa

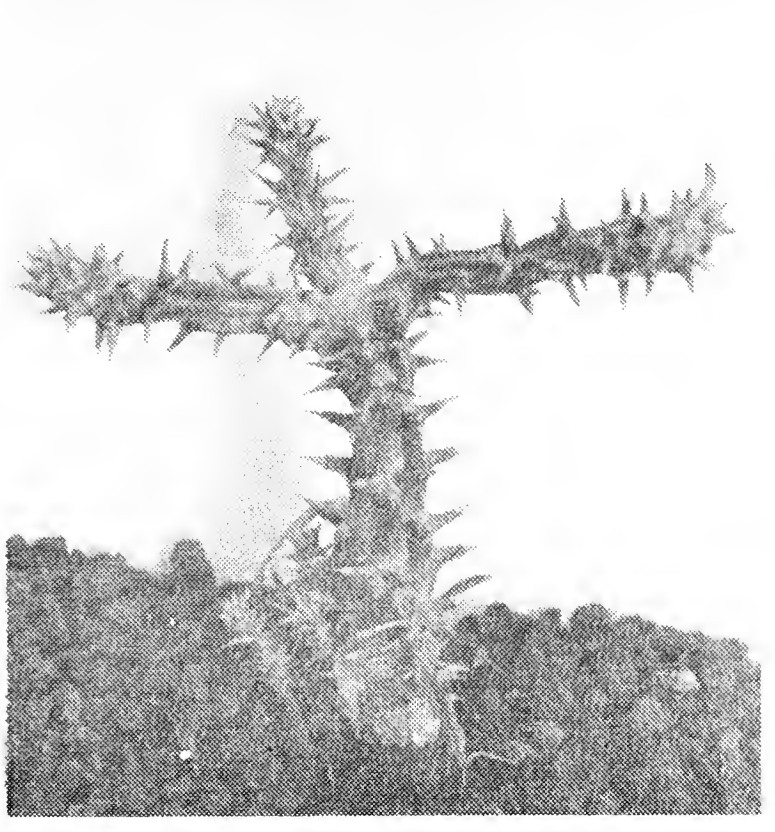


Pachypodium lameri — Madagascar

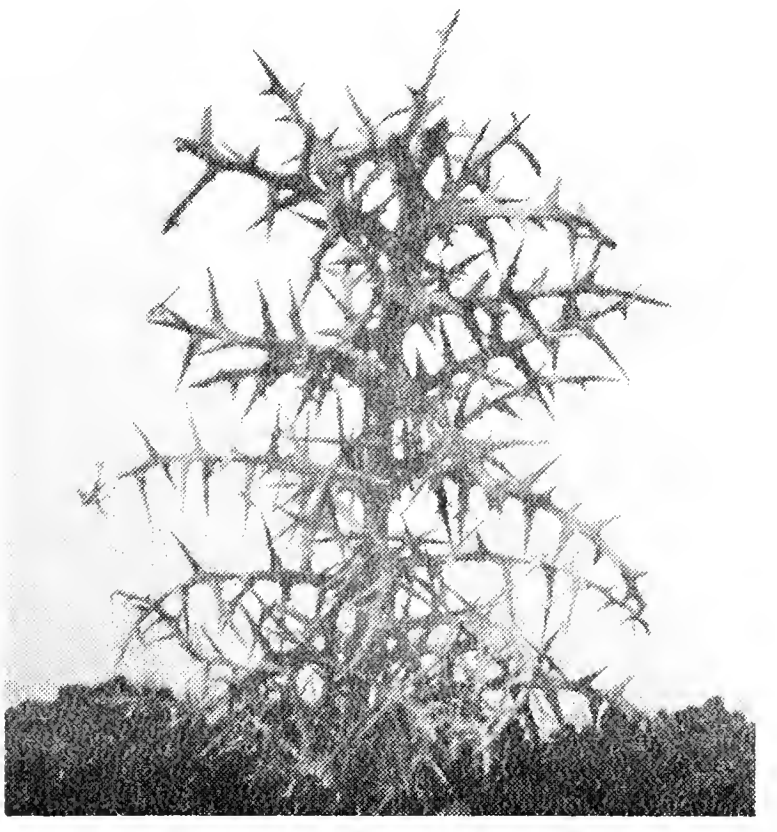


Pachypodium saundersii — Zululand

Dioscorea macrostachya—South Africa



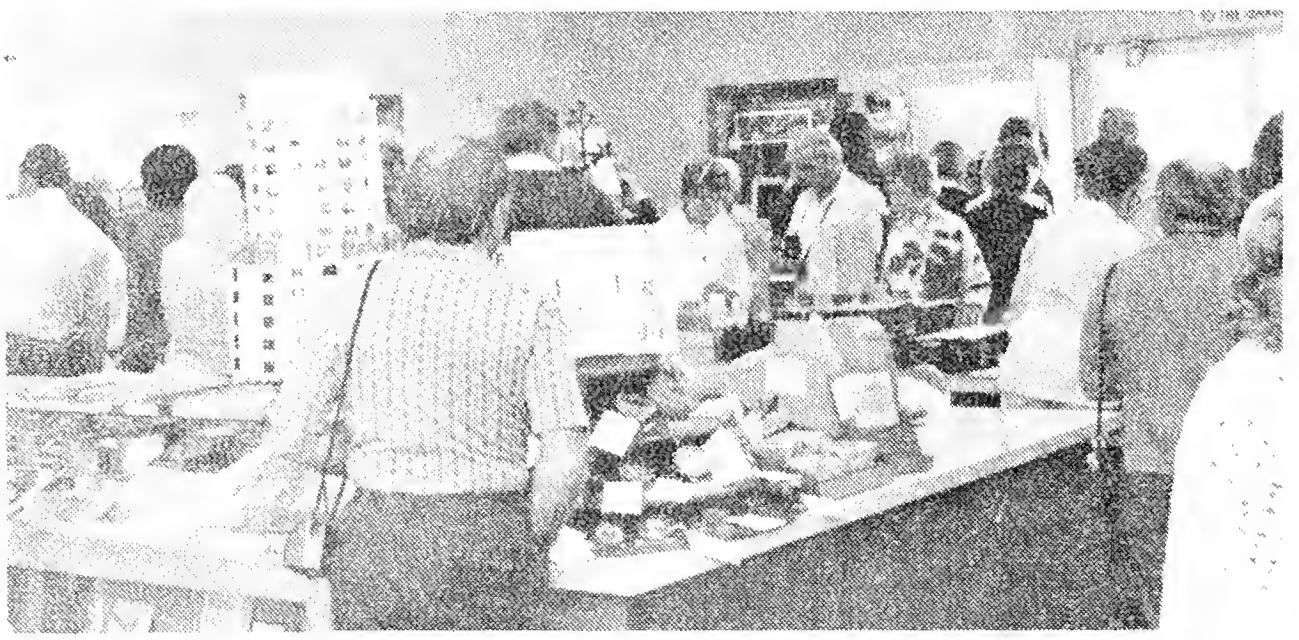
Pachypodium densiflorum — Madagascar



Euphorbia stenoclada — Madagascar

RECENT CACTUS SHOW REFLECTIONS

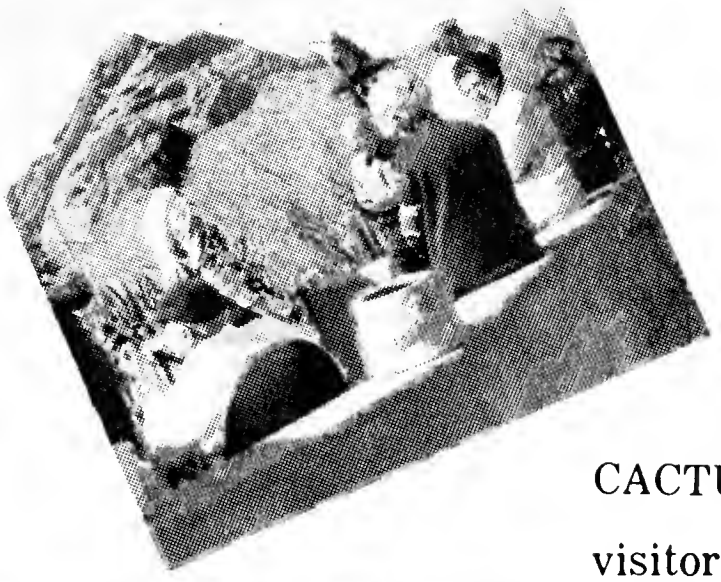
John Hales, a daily Show volunteer, explaining plants to a couple.



VISITOR CENTERS'— Visitors purchasing 'goodies.'

"They sure are neat!"

RELAXING IN THE FIELD



CACTUS SHOW visitors enjoying the beauty of the Garden and its gorgeous display of flowers.

ANOTHER GARDEN PROJECT

17 rolls at 20 rods per roll equal 5440 ft. of 4 ft. high hog wire fencing that we will use on our north and west boundaries to then enclose the Garden from wanderers and jack-rabbits.

The same type of wire was installed by the Phoenix Parks and Recreation department on the east and south borders of Garden. A portion of the Papago Bike Pathway is along and within our east boundary.

GARDEN ACTIVITIES

MAY

Sat.	3rd	FIELD TRIP—Mingus Mountain	8:30 A.M.
Sun.	4th	MEMBERS ANNUAL MEETING	3:00 P.M.
Tues.	6th	CACTOMANIACS—Potluck Supper	6:30 P.M.
Sun.	25th	CENTRAL ARIZ. C & SS—Meeting	2:00 P.M.

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

VOL. XXIX June-July, 1975 No. 6

REG MANNING

SAGUAROLAND BULLETIN

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Cover photo: *Penstemon parryi* with its large bluish flowers on erect stems up to seven and half feet in your Editor's garden. The usual height in Arizona is four feet.

Desert Botanical Garden of Arizona

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Editor's Notes

Despite energy crunch and recession, our 1974-75 fiscal year showed a most healthy increase, with 15 per cent gain in attendance and 31 per cent rise in gross sales. We had expected a steady lowering, as in the previous year, but a marked upswing began in January and continued to May, and has not yet diminished.

The coming summer, with its usual lower attendance and activities, will give the Garden staff an opportunity to take well-earned vacations and then get underway our large and small projects. June will see some contractors beginning projects that are listed in the financial report.

What did we do last year? Read on—

Installed 2400 lineal feet of three-inch transite water pipe to increase water pressure needed for present and future watering needs.

Aligned and graded the old service road and added a parking area for 60 cars.

Installed wrought-iron window grills and screened wrought-iron doors for Administration Building, Library, Herbarium and Visitors' Center.

Built a new main entrance to the Garden with walled planting beds and wrought-iron gates as a memorial to Charles Mieg.

Installed evaporative coolers in the Auditorium, a gift from Lucille Blessing Earle.

Fenced in the area now included in our lease from the Phoenix Parks Dept. for a new service road.

Installed a eucalyptus grove of plants, trees, plastic pipe, drippers and pump, a gift from Ron Gass, Mountain States Wholesale Nursery.

Trebled the size of our Australian Trees section.

And the City of Phoenix installed 5100 ft. of four-foot fencing on our east and south borders, the east border fence being moved onto our property so as to make room for the new Papago Bike Trail.

In November 1973, with the approval of the Board, the Garden presented to the Arizona Bicentennial Commission detailed plans for an Arizona Plants Nature Trail to be built in an undeveloped area of the Garden. Our plans were approved and endorsed, so that we became candidates for a portion of the Bicentennial Commission funds when final distribution was made, the Commission alloting up to $20,000 if we had matching funds.

Unfortunately, when the appropriation was distributed among applicants, the Garden received no money, despite the fact that we had matching funds in our Building Fund.

It now appears that we will have to construct the Nature Trail ourselves, a project which will take several years to accomplish, since we must raise the total amount of money alone.

A few words of explanation for some of the items in the financial report: The Schroeder fund total is less this year because money from it was used to purchase rare plants. (See the report on plant accessions). The Miscellaneous figure under Income is less only because of a change in bookkeeping methods for clarity. Under Expenditures you will note that we spent less on advertising. This had, as we expected, no effect on attendance,

mainly because we have received excellent publicity. Maintenance expenditures were lower, too. We did much in the previous year, and plan some for coming year, so 1974-75 was a "lull."

This year we will include reports on the Agave Program, Herbarium, Accessions, Seed List, Library and Bookstore, to give you a look-in on various departments of the Garden.

MEMBERS' ANNUAL MEETING

On Sunday, May 4th, members filled the Richter Memorial Library for the annual meeting. Board President John Rhuart presided, with Lucille Blessing Earle acting as temporary Secretary. Mailed-in votes were counted, and Alice Feffer, Angela Bool and Richard Snell were re-elected for three-year terms.

Garden Director W. H. Earle reported on the Garden's finances, last year's accomplishments, and plans for 1975-76.

An exceptionally fine Owl Kachina was given to the Garden by Alice Feffer, for display in the Library and is most appreciated.

ANNUAL BOARD MEETING

On Wednesday, May 21st, the annual dinner and board meeting was held at the Phoenix Country Club. John Eversole, Chairman of the Board, presided. Minutes of the last meeting were read by Secretary Angela Bool and were approved. The financial report was presented by Treasurer Tom Goodnight, and is published in this issue of the Bulletin. The Retirement Fund was scrutinized, and met with the Board's approval. Proposed building projects for 1975-76 were reviewed by Les Mahoney. A summary of last year's activities and projects for next year were given by Director W. H. Earle.

Committees were formed to study the Garden's by-laws and examine the possibilities of combining the Executive and Advisory Boards, and changing the close of the fiscal year from April 30 to December 31. Committees will report at the September Board meeting.

The one discouraging note was the report that the Arizona Bicentennial Commission declined assistance in financing our Arizona Plants Nature Trail, in spite of the fact that they were very much interested last year in doing so.

REPORT ON THE AGAVE PROJECT

During the past 12-month period, work on Agave has proceeded in its several phases: (1) specimen collection from country and gardens; (2) mounting of specimens and measurement of organs in the laboratory; (3) write-up of taxonomic sections and special studies.

Several in-state field trips were made and two to Mexico. A July excursion was made through northern Chihuahua and the adjacent state of Coahuila by Rodney Engard and Mary Getz. They drove over 3000 miles and collected about 200 plant specimens, 9 of which were of the family Agavaceae. While winter-spring rains were light or lacking in that region, with little floral response, they did find flowering specimens of several local endemic Agaves. Howard and Marie Gentry during January and February made an extended foray into the Jaliscan plateau region of western Mexico. They were joined in Zacatecas by Dr. and Mrs. Rogers McVaugh of the University of Michigan and graduate student Gordon McPherson. McVaugh is working on a flora of the Jaliscan Plateau Region, or, as he calls it, "Nueva Galicia." About 5000 miles were logged altogether. Several high and remote mountains were attained, the most notable being the Sierra de

los Huicholes, where Indians of that name still carry on their language and culture in isolation. A new lumber road now gives access to this mountain where four states nearly conjoin: Durango, Zacatecas, Jalisco, Nayarit. About 100 plant collections were obtained in wild and beautiful country, 40 of these being in the Agave family.

Jane Sauck with Howard Gentry completed an anatomical study of the Agave epidermis with special emphasis on the stomatal structure. The study was designed to supplement Gentry's classification of the Agave. The cuticle of Agave peels off dry or fresh leaves quite readily. When stained and mounted on glass slides, the fine structure together with the stomates reveal a lot of specific structure under the microscope. This technique is useful in identifying isolated leaf specimens, especially when the leaf is atypical of any given species. It supplements the criteria as customarily used in the gross morphology of leaves and inflorescences. The results of this study will be incorporated in Gentry's account of the Agave of the California Gulf Region, which we hope to see in press next year.

—Howard S. Gentry

PLANT ACCESSIONS REPORT

In this past year the Garden has been able to acquire through various sources 470 lots of plants or single plants. The number of rare plants acquired has been greater than in any other period of the same length. Money from the Clifford M. Schroeder Memorial Fund made possible the purchase of a carefully selected group of rare succulents. We hope as these plants mature to propagate them from seed or cuttings. A shipment of 75 aloes, representing 23 species, was received from Dr. J. Dodson of the International Succulent Institute last fall. Many are rare and beautiful plants never before grown at the Garden.

The agave research carried on by Dr. Howard S. Gentry of our staff has contributed many plants new to cultivation in the Agavaceae, the Cactaeae, and other succulent and non-succulent families. Field-collected and cultivated plants have been donated by 35 Garden members and professionals associated with plant science in many parts of the world. Lydia Armbruster gave us a specimen of **Jacobinia candicans** she had grown from wild stock. This native Arizona plant has flowered continuously since it was placed in the ground last year.

Other interesting acquisitions include the following:

Furcraea macdougallii a rare succulent of tropical Mexico donated by Paul Shaw of the Living Desert Museum at Palm Desert, California.

Aloe saldenia, an uncommon aloe from South Africa, from Kent Newland of the Boyce-Thompson Southwestern Arboretum.

A beautiful crassulaceous plant, as yet unidentified, was collected on the slopes of Mount Kilimanjaro and donated by Mrs. Joseph Henske. She reports that in its native habitat it forms a silver-white shrub.

Long-time members Ed and Betty Gay contributed several species of rare dwarf Mammillarias, together with collection data.

A new member, Mrs. Helen Rubichek, donated three species of Salvia, previously untried in the Garden.

Don Cole of the Arizona State Highway Department presented the Garden with a new and welcome species of Australian wattle tree, **Acacia notabilis.**

The National Arboretum sent several specimens each of shrubs native to the Turkmenskaya S. S. R. (a desert area of the Soviet Union north of the Black Sea).

One of the more unusual gifts, because of its source, was an offset of **Agave americana** sent to the Garden by Dr. Zoltan Dbrescky of Budapest, Hungary. While

visiting in Spain, shortly after spending a week with staff members here, he collected it from a wild naturalized stand of plants north of Barcelona.

The horticultural staff is of course always on the lookout for the unusual plants on their frequent field trips to remote and nearly inaccessible localities in Arizona and Mexico.

Gifts and purchases from five nurseries added many plants. In particular, Ron Gass has been most generous in aiding the Garden with supplies as well as native and exotic plants.

Finally, seedlings of trees, shrubs, cacti and other succulents have been grown by the staff. The seeds have come from many varied sources. Primarily they come from exchange with other institutions, but many are also collected by Garden members and staff. Among the more interesting succulents this year is **Calibanus hookerii**, a caudiciform Nolina-like plant from Mexico. The seed obtained from the university botanical garden in Mexico City germinated after five months in our greenhouse.

—R. G. Engard

HERBARIUM REPORT

There has been continuing growth in the herbarium. The total number of sheets deposited there has increased from 10,508 on the first of the year to a present total of 11,457. Our exchange program with Brigham Young University and Northeastern Louisiana University has increased the herbarium's representation of plant material from Utah, Texas, and Louisiana. Just recently we were presented with a collection of over 100 sheets of cacti collected by Lyle McGill, a former member of our staff, and members of the staff at ASU. Finally, a word of commendation for Rodney Engard, our superintendent, and his staff, who have been avid collectors this spring.

—J. Harry Lehr

REPORT ON THE 1975 SEED LIST

Collecting seed and preparing a seed list for international distribution among universities, research stations and other botanical gardens is one of the important services a botanical garden performs. This year we published our tenth annual Seed List on December 1, sending approximately 100 copies to institutions in 37 different countries.

Seed lists are a source of materials for a variety of botanical purposes. We have supplied seeds for plants that may furnish new crops, medicines and insecticides, plants that help reclaim marginal land, and plants that can be used horticulturally. Some of the plants at the Garden were grown from seed offered by other institutions.

Our 1975 Seed List is a selective one, restricted to desert species, cacti and succulents. This year we offered seeds of 59 different species, including 18 in the very fine Agavaceae section, 10 in the Cactaceae, and 12 in the Leguminosae. Sixteen species are listed that have never before appeared on any seed list we have seen, mainly because of collections made in Arizona and Mexico by Dr. Gentry, R. G. Engard, and Mary Getz. The demand for this new material has been heavy.

In addition to presenting new material, our Seed List is distinctive in that it gives valuable collection data for each species offered.

Every effort is made to see that all seeds are viable, and requests are filled on receipt. We have Mary Hale and Lee Staver to thank for this. These two volunteers have done a meticulous job of packaging seed for mailing. Together with Gertrude Siegel and

(Continued on page 71)

ASPECTS OF OUR GARDEN

Here is a view of the Garden from a point near the Succulent House, looking west past the Cactus Lath House toward the red and wind-pitted Barnes Butte. The flowering yucca is **Yucca elata**, sometimes called the Soaptree Yucca, and in front of the Cactus House a Palo Verde, **Cercidium floridum**, is in bloom.

ARIZONA CACTUC & NATIVE FLORA SOCIETY, INC.
SPONSORING THE
DESERT BOTANICAL GARDEN
FINANCIAL REPORT
5-1-74 — 4-30-75

	Comparison 1974-1975	1973-1974
ASSETS:		
Accounts Receivable	$ 676.30	$ 274.20
Inventory: Sale Items	26,325.52	22,603.08
Deposit, State Compensation Fund	534.00	534.00
A. CASH:		
VNB Checking Account	220.00	4,515.37
Petty Cash, Pop Machines, Cash Register	345.00	295.00
B. SAVINGS:		
Retirement Fund	16,007.96	10,818.56
VNB Savings Account	25,159.59	33,992.04
First Federal Savings (C of D)	7,099.60	6,600.00
First Federal Savings, Savings Acct.	488.40	271.03
Southwest Savings	5,406.12	5,056.55
Flower Preservers	683.85	650.47
IN TRUST:		
Clifford M. Schroeder Memorial Fund	403.34	670.39
	$83,349.68	$86,280.69
LIABILITIES:		
Accounts Payable	$ 0	0
Arizona State Compensation Fund	133.00	108.23
Arizona Withholding Tax	81.95	70.89
Arizona Unemployment Tax	150.00	137.98
	$ 364.95	$ 317.10
INCOME:		
Retail Sales	$119,636.36	$ 90,189.50
Retail Sales Tax	4,445.83	2,413.51
Wholesale of Garden Books	6,624.90	4,820.19
Wholesale of Cactus Seeds	3,312.56	3,987.90
Contributions	4,696.92	1,427.63
Voluntary Admissions	27,206.65	21,701.02
Memberships	7,695.80	7,107.52
Endowment	16,000.00	16,000.00
Library Fund	333.17	10.00
Interest and Dividends	2,466.24	206.28
Miscellaneous	387.66	9,273.04
Indirect Costs, NSF Grant (Agavaceae)	3,120.00	3,120.00
Transferred from Savings	34,212.69	0
	$230,138.78	$160,255.59

EXPENDITURES:	1974-1975	1973-1974
Purchases for Bookstore Resale	$ 61,593.32	$ 50,501.38
Arizona Retail Sales Tax	4,445.82	2,324.53
Gross Wages	65,780.10	50,001.19
Payroll Taxes, Federal Employment	7,279.41	4,182.39
Office Supplies and Stamps	1,294.62	1,409.92
Library Books, Subscriptions, Supplies	394.10	796.91
Herbarium Supplies	385.81	151.02
Monthly Saguaroland Bulletin	2,642.79	2,340.92
Utilities	5,069.09	4,436.72
Fleet Expenses	2,033.80	1,808.18
Insurance: Life, Accident, Hospital	3,042.50	2,654.50
Retirement Fund	9,661.75	9,101.56
Insurance: State Comp. Fund	1,344.97	779.62
Insurance: Fire, Theft, Liability and Property Damage	2,149.00	2,261.00
Cactus Show	635.31	427.74
Travel, Entertainment, Public Relations and Miscellaneous	1,502.45	592.24
Advertising	210.48	484.14
Garden and Building Maintenance	2,834.02	6,312.54
Lease	25.00	25.00
Miscellaneous	920.65	5,229.91
Capital Improvements	28,002.62	130.99
	$201,247.61	$146,821.40

MISCELLANEOUS CHARGES ITEMIZED:

Vandalism	$ 106.42
Office Equipment	814.23
	$ 920.65

CAPITAL EXPENDITURES ITEMIZED:

New Service Road and Parking Area	$ 4,880.70
Grillwork: Doors & Windows	3,934.00
Mieg Memorial Gate	5,722.60
New Water Line: 2400 ft. (Contracted)	14,249.54
New Air Conditioning in Auditorium	1,686.00
	$ 28,002.62

ATTENDANCE: 95,784 persons contributed $27,206.63 or $0.283 to Voluntary Admissions, compared to 81,493 persons contributing $21,701.02 or $0.275 per person during 1973-1974.

PUBLIC RELATIONS

The following groups met at or toured the Garden:

1	Annual Cactus Show	16,803	
1	Board Meeting	9	
18	Boy Scouts & Cubs	176	
8	Camp Fire, Blue Birds	79	
3	School Bike Tours	121	
16	Girl Scouts, Brownies	231	
15	Classes: Desert Plants	540	
23	Lectures: Flora & Fauna	653	
1	Members Meeting	12	
6	CACSS Meetings (Cactus Club)	118	
9	YWCA Groups	321	
28	College & University classes	644	
68	Elementary & High Schools	3,522	
1	Sunday School Class	14	
4	Garden Clubs	74	
5	Senior Citizen Groups	114	
2	Williams AFB	53	

1	Statesmen's Club	15
1	Junior League	16
1	Symphony Guild	30
1	Faculty Wives, ASU	30
5	Commercial Photographers	14
	Out-of-State Groups:	
6	Hotel-Motel Guests Tours	320
3	Commercial Tours	480
1	International Traffic Club	160
1	Wives: Amer. Soc. Arms Coll.	40
1	Wives: 200 Club	10
1	SW Section of 99's (Pilots)	87
4	Botanists-Biologists	64
1	Rotarians from India	12
	Garden personnel participated in these events away from the Garden:	
Mojave School		120
Cactus & Succulent Soc.		18
New Homeowners' Class		12
Home Landscaping Fair		3,500
Adult Vacation Plans		21
Epsilon Sigma Alpha Sor.		20
Phoenix Rose Society		62
CSSA Board Meetings		18
IOS Convention		200
Garden Club of Phoenix		52
Phoenix, Camera Club		56
SWPMA Board Meetings		26
Valley Forward		60
Field Trips		197
Class Field Trips		92
Also meetings of:		
Arizona Academy of Science		
American Association of Botanical Gardens & Arboreta		

Memberships for 1974-75

Members	1,295
Exchange	98
Publicity	43

RETAIL SALES: $119,636.36 divided by 95,784 persons averaged $1.25 per person compared to $90,188.50 divided by 81,493 persons averaging $1.11 per person during 1973-1974.

Stored in the PUBLICATION BUILDING the following books for continuing sales:

Number of Copies	Title	Cost	Wholesale	Retail
7,449	CACTI OF THE SOUTHWEST at $0.42 each	$3,128.58	$8,717.55	$14,525.55
1,587	CACTUS & SUCCULENTS at $0.14 each	$ 222.18	$ 714.16	$ 1,190.25
26,000	NATURE WALK at $0.06 each	$1,560.00	$ 0	$ 6,500.00

NATIONAL SCIENCE FOUNDATION GRANTS FOR THE STUDY OF AGAVES
By Dr. HOWARD S. GENTRY

Amount of Grants $32,200 to be disbursed from September 1972 to September 1975.

4-1-74 — 3-31-75

Cash on Hand		$2,204.54
Received		8,937.00
		$11,141.54
Expenses:		
Salaries	$2,321.23	
Taxes	513.54	
Indirect costs	3,120.00	
Supplies, expenses	331.65	
Field trips	1,891.68	
Illustrations	705.00	
		$8,883.10
3-31-75 Cash on Hand		$2,258.44

ANTICIPATED GARDEN IMPROVEMENTS: 1975-1976

Install 4′ hog wire fencing on west & north boundaries of Garden	$ 1,100.00
Install evaporative cooler in Glass House for cooling so seedlings can be grown in summer	$ 125.00
Work on Arizona Nature Trails section of Garden	$13,000.00
Conduct Plant Sale, April 11, 1976, of "Hard to Find Plants"	———
Add office space and make current office into reception office, install brick patio	$ 4,000.00
Bring Plant Accession Records up-to-date	$ (370.00)
Dedicate entrance gate to Charles Mieg	———
Paint Visitors' Building, Auditorium, etc.	———
Pave Service Road and Parking Area	$13,000.00
Put water line thru center of Garden W-E 100′ N of present line	$ 800.00
Put paths along wash running through Garden	$ 2,000.00

(Continued from page 66)

(on our rare rainy days) members of the staff, they prepare new seed for storage and also keep records of orders.

During the first six months we filled 43 requests for seeds, each request listing one to twenty species. It is obvious that interest in desert plants is great, and that our sometimes strenuous efforts to collect seeds is worthwhile.

—R.G.E.

BOOKSTORE REPORT

The total gross retail sales in the bookstore for the past year increased by nearly $30,000 (see details in Financial Statement). More importantly, the average sale amount was higher than last year's.

The bookstore was open every day of the year, including holidays, the staff working alternating weekends. A number of our valued Garden volunteers had to drop out because of illness. Still working regularly and helping with our various sales and stock chores are Margaret Jenkins, Mildred Hunt and George Anderson.

The items for sale in the bookstore all pertain to the desert. They include 85 different books and 33 different types of gifts. (Candles, for example, count as one type, although we sell four different styles in three sizes each. There is also a great variety of jewelry and of other types of gifts, so the total **number** of items we sell is quite high.)

The types of gifts sold also include place mats, jellies, candies, wind bells, dolls, geodes and boxed minerals, notepaper and cards, film, slides, planters, individual and boxed collections of cacti, seed packets, terrariums, cholla-wood items, maps and posters, to list only some. Items that we handle exclusively appear to sell best, the hand-woven mats and the Indian-made dolls, for example. Others that sell well include our new terrariums and planters, stationery, jewelry and wind bells. The books which range in price from $1.50 to $35.00 are consistently good sellers.

During the past year we sold 6751 boxes of pre-packed cacti. Of this number approximately one-third were mail-ordered or bought at the store and mailed by us. No boxes of plants were mailed during the winter months because of the likelihood of damage by freezing in transit. We told purchasers that we would start mailing on March 15, but the extremely cold spring weather forced us to delay mailing until April 15. By

that time 400 orders had accumulated which had to be filled all at once, a big job for our staff.

The problems of mailing boxed cacti safely have increased this year to the point where we have decided to stop all mailing, at least temporarily. This will cut down on our sales of the item, but seems the only sensible thing to do.

Ann Shelstad
Don Shelstad
Lynn Trainum
Lela Turner

LIBRARY REPORT

There are 5,186 books in our library, which is a botanical collection devoted mainly to cactus and succulents, but also including material on deserts and dry-area plants. Our oldest books were published in the 1500s, our newest ones this year. Languages represented include German, French, Spanish, Portuguese, Swedish, Dutch and Afrikaans.

In addition to the books we have 296 different botanical periodicals, 100 of them currently being published. The other periodicals, some reaching 16 bound volumes, date from the early 19th century to the middle of the 20th. The current periodicals reach us from all parts of the world.

The library wing was built in 1967, when Max C. Richter decided to give his entire library to the Garden. The Richter books began arriving in 1966, and the wing was dedicated as the Richter Memorial Library in April 1970.

In 1968 Eleanor Radke started to catalogue our existing library and also the Richter books as they arrived.

This is not a circulating library; all research must be done here. During the past year our register of library users shows some interesting details: Researchers from England and Finland as well as from Maryland, Tennessee, Louisiana, Ohio and Nebraska have used our books. Their subjects, besides cacti, included taxonomy and xerophytes in general, and individual plants such as Beloperone, Pectocarya, Idria, Larrea and Phoradendron.

This year's book funds were devoted mainly to acquiring newly published books in our field, seventeen books being bought from the Mieg Memorial Fund, and many others from different memorial donations. Next year we hope to concentrate on our needs in out-of-print books.

An important part of our library work has been performed by volunteers Elizabeth Fritz and Dorothy Carson.

—Peg Gill, Librarian

CACTI SEEDS • WILDFLOWER SEEDS • CACTI SEEDS

Did you know that the Desert Botanical Garden is the only Garden in the world that is a collector and procurer of cacti seed? We have many families in Mexico who gather and ship cacti seeds to us and are paid so much per kilo. We then reclean the seed, store and later ship cacti seeds to wholesale seed houses who last year bought 165 pounds.

Another note of information that should interest you is that our Volunteers and staff packaged 3900 packets of cacti seed and 5240 packets of desert wildflowers seed that were sold last year at the Bookstore.

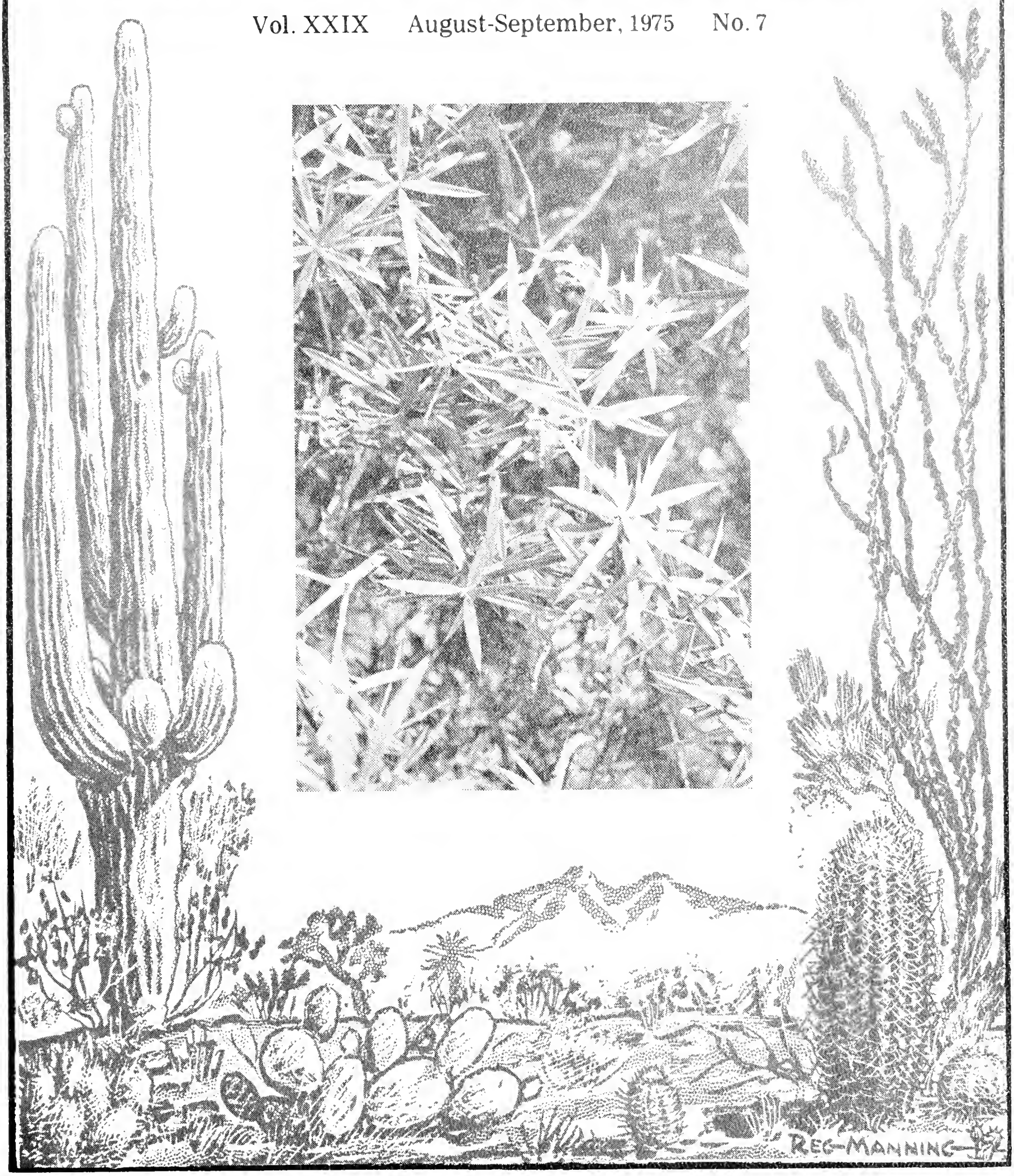
Needless to say the profits of the above operations go into our general operating fund.

—W.E.

SAGUAROLAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

Vol. XXIX August-September, 1975 No. 7



SAGUAROLAND BULLETIN

Published and owned by the Arizona Cactus and Native Flora Society, sponsors of the Desert Botanical Garden of Arizona, P.O. Box 5415, Phoenix 85010. Saguaroland Bulletin attempts to promote the Garden and to provide information to the desert plants and their culture. Subscription $5.00 per year, the subscription including active membership in the Society and the Desert Botanical Garden. Issued 10 times a year.

W. HUBERT EARLE, Editor
LILLIAN DIVEN, Associate Editor

Vol. XXIX | August-September, 1975 | No. 7

Arizona Cactus and Native Flora Society

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COVER: Dense, dark-green San Juanico
Photo — WHE

Desert Botanical Garden of Arizona

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Maintenance & Bookstore ..... Donald C. Shelstad
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Student Horticulturist ..... John Moresco

Garden Open Daily 9 A.M.-5 P.M. Including Holidays

Editor's Notes

To the two questions "How hot does it get at the Garden during the summer?" and "What does the Garden staff do during the heat?", the answers are "Very" and "Heavy maintenance and construction projects".

The usual weather pattern brings the summer's hottest but driest weather in late June and early July, with the thermometer hitting 115 degrees for the first time about July 4th, then temperature decreasing gradually to the lower 100s, and humidity increasing as the monsoon begins to penetrate the state in late July and early August, with one-half our annual rainfall (3½ in.) coming in August. Cooling doesn't begin until October.

This year was somewhat cooler until August 1, although the humidity was higher than normal, which made working outdoors more tiring. Then on August 4th came a record-breaking week of 116, 115 and 114 degree days that, even with unnaturally low himidity, made work decidedly uncomfortable.

If we could, we'd postpone many jobs until fall, but it isn't possible.

To try to get the necessary jobs completed, the staff comes to work at 7 a.m. and starts working outdoors in the "cool" high-80s, continuing until noon. Then in the afternoon we water plants and seedlings in the lath houses and propagation areas, pot-up young plants, and clean and sort seed for our Seed Exchange program in the comparative shade. Nobody can say this is comfortable work; we should all be able to endure with ease any "fiery furnace" in the next world.

Ever been involved in a "jackrabbit drive"? For the past two years the Garden has been eaten "out of house and home" by an invasion of jackrabbits and cottontails driven in from the surrounding desert by two dry years that produced little in the way of food.

In July we finished installing 10,500 ft. of two-ft.-high poultry netting against our wire boundary fence to keep out more rabbits, and left a corner open for a temporary "rabbit exit". Then we called in the Boy Scouts and Cubs of Tempe who assembled with their leaders on July 21st, bearing noisemakers, whistles, garbage can lids, to form a line the width of the Garden. They drove the rabbits before them toward the gap in the fence and scared many out into the desert of adjoining Papago Park. We quickly closed the opening, though several rabbits darted back through the legs of our beaters to rejoin other rabbits we had failed to flush. It was great fun.

On August 4th our staff had another drive and were successful in urging another 20 to 25 rabbits to eat elsewhere.

We already notice a drop in rabbit density, and plan several more drives after our summer rains green up the desert.

Your Editor will be attending the American Association of Botanical Gardens and Arboreta on the island of Kauai from September 4th through 9th. These annual meetings are always helpful in gaining new ideas that can be applied to your Garden. I admit I look forward to feeling the trade winds instead of our persistent heat.

Desert Perennial

SAN JUANICO
Jacquinia pungens A. Gray
Theophrastaceae
Joewood Family

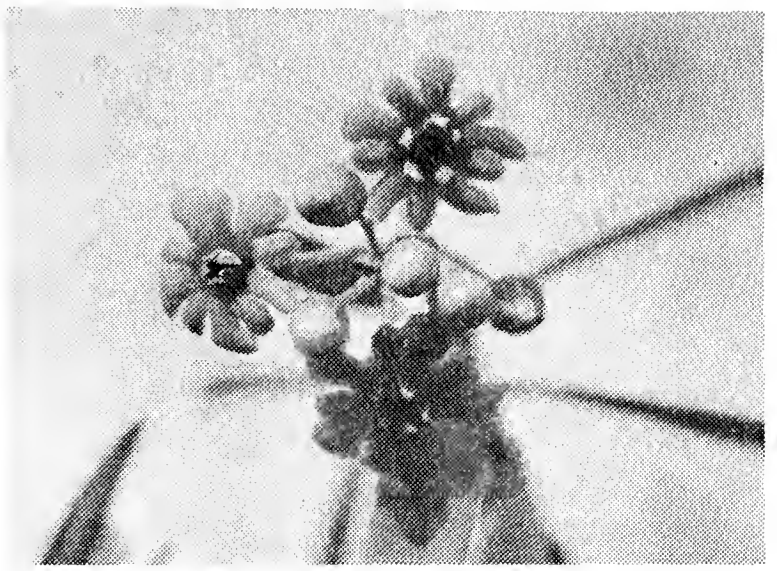
If you are looking for a dense, drought-resistant, impenetrable hedge you might consider this attractive shrub. It is, however, slow-growing and you must grow it yourself, since it is not available in local nurseries. Normally a shrub less than 2m high, San Juanico may eventually reach 7m in the more mesic habitats of its range.

The Theophrastaceae are a family of 4 genera and about 60 species. The members are endemic to warm areas of the Americas and the West Indies. The only member native to the United States is found in the Florida Keys. **Jacquinia pungens** is native to much of the Sonoran Desert lying south of the Arizona-Mexico boundary. It does well in the Phoenix area despite its more southerly natural distribution. In addition to Sonora, it is present in various habitats from near sea level (Tiburon Island) southeast to the area of Vera Cruz on the Gulf coast. From there its range extends south to Chiapas and Guatemala. The type is from Sonora between Rayon and Ures. The elevational range of its habitat is between 50 ft. and 2000 ft. On the plains of Sonora it is associated with **Forchammeria watsonii**, **Vallesia glabra**, **Guaiacum coulteri**, **Bumelia occidentalis** and large cacti of several genera.

Several vernacular names are in use in Mexico. Among them are San Juanico (Sonora), San Juan, San Juanito, Pinicua and Rosadilla (Durango).

The compact, symmetrical crown of dark green opposite leaves from the single or multiple gray-barked trunk is quite dramatic in contrast to the parched brown landscape of Sonora in the dry season. The leaves are linear-lanceolate to elliptic-oblong, 3-6 cm long, acute, nearly sessile on the stems, and rigid. The spiny leaf tip which is a hazard when picking the fruit is the reason for the descriptive specific epithet of **J. pungens**. The depressed prominent midvein of the leaf and the slightly revolute margin are also rather distinctive.

The flowers are perfect and regular. Floral characteristics include: calyx with five fleshy lobes, five functional stamens alternating with five petaloid staminodes, a persistent style having an entire or faintly lobed stigma, and a corolla with a 4-5 mm long tube and a salverform limb 6-8 mm wide. The corolla and staminodes are reddish or orange yellow. The flowers occur in short racemes throughout the year but most abundantly from May to July. The corollas are so thick and tough



that they are removed from the receptacle intact by the Mayo, Seri and Yaqui Indians and strung as necklaces and bracelets. Martinez reports that the boiled flowers are used medicinally in treatment of earache. A durable yellow dye has been extracted from the flowers for use in basketry.

The fruits are hard, thick-shelled, and globular to elliptic-ovate. In size they may range to 2 cm long. The color when ripe is tan or yellowish. A hard spine, usually brown tipped, is present at the free end of the fruit and represents a persistent style. The few-to-many maroon-brown seeds are .5 cm long and .3 cm wide. They are flattened on one side, compressed and ovate in outline. The few ovules are immersed in a greenish matrix of pulp before ripening. The Seri Indians eat the fruits when green and utilize them as rattle beads when dry. The fruits, in addition, are used to stupefy fish along the Sonoran coast.

Field Marks: Dense symmetrical shrub with pungent, dark green, opposite leaves. Orange flowers with thick salverform corollas. Hard-shelled ovoid fruit up to one inch long with spine at the free end and dark brown seeds in matrix of sticky tissue.

REFERENCES

Gentry, Rio Mayo Plants
Shreve and Wiggins, Veg. & Flora Son. Des.
Standley, Trees & Shrubs of Mexico

Photos — WHE ——RGE

Arizona Wildflower

PRINCE'S PLUME
Stanleya pinnata

Cruciferae
Mustard Family

A handsome Arizona native with a long blooming season, distinctive enough to be identified at a glance from the window of a moving car — that's what Prince's Plume is.

From late spring through the summer months you can see clumps of three-to-five-ft. tall stalks topped with feathery yellow flowers and fringed for much of their length with long, slender, drooping seed pods that move in the slightest wind. Certainly, Prince's Plume is an appropriate name, and we can thank Helen Hunt Jackson for it. Jackson, best known for her popular novel "Ramona", was a Californian interested in the plants as well as the Indians of her area. It seems odd that such a striking plant had never until her time acquired a common name, but we may be glad that it was left for the perceptive novelist to "baptize".

Stanleya pinnata is widespread in Arizona's dry plains and mesas at elevations from 2500 to 6000 ft. It blooms from early April through September.

Like other members of the Mustard Family, it has four-part flowers: four petals and four sepals with long, curving claws. The anthers are remarkably long and narrow and also curved. The long, narrow buds at the top of the raceme are almost upright, while the long, narrow seed pods first extend horizontally from the flowering spike, and then later droop. All these features combine to make the

flower-tipped stem resemble the feather of some giant green-and-yellow bird.

The only other wildflower that could possibly be confused with it — and only for a moment — is the Yellow Bee Plant, *Cleome lutea,* but the Bee Plant is only half the size of Prince's Plume, and its flowers are arranged in rounded heads at the ends of branched stems — nothing plume-like about it.

This is an "indicator plant". It requires the mineral selenium for growth, and is found only where that poisonous mineral is in the soil. Plants can accumulate toxic levels of selenium, and livestock eating them would develop chronic selenium poisoning, evidenced by the blind staggers and alkali disease. Fortunately, the plant has very low palatability as forage, so livestock eat it only in desperate circumstances.

There is no evidence of its poisoning humans. As a matter of fact, the tender stems and leaves are edible if they are blanched in two or three changes of water. They were used as a pot herb by Indians. (We have often wondered how primitive people in various parts of the world discovered that a poisonous plant could be made edible. If you found that a new plant made you sick, wouldn't you simply classify it as inedible?)

The seeds of Prince's Plume were also used for food. They were made into a mush. *Stanleya pinnata's* range is from North Dakota to Idaho in the north, south to Texas, Arizona and California. In Arizona it is found from Apache to Mohave Counties and southward through Yavapai and Gila Counties to Yuma County.

REFERENCES

Armstrong, Field Book of Western Wild Flowers; Kearney & Peebles, Arizona Flora; Kirk, Wild Edible Plants of the Western United States.

Photos — WHE —LD

ASPECTS OF OUR GARDEN

Cactus wrens build their ungainly, bundled nests in the native Cane Cholla (*Cylindropuntia spinosior*) at the Garden, and doves use the same cactus as scaffolding for their flimsy platform nests that are usually, though not always, sufficient for the purpose. The heavy-flowered yucca (*Y. faxoniana*) comes from the deserts of Texas and Coahuila.

THE MAN—AGAVE SYMBIOSIS

by Howard Scott Gentry

(This is the opening address Dr. Gentry gave at the Biennial Convention of the Cactus and Succulent Society of America in San Diego on May 12, 1975, at which he was awarded a Fellowship in the C&SSA.

We heard from many convention delegates that Dr. Gentry's talk was a fascinating presentation of unfamiliar material that our readers would be sure to find interesting. Dr. Gentry did not intend to publish the address, but has kindly consented to let us use it in the BULLETIN along with illustrations from the slides that accompanied it. Material used in this address will be incorporated in his forthcoming monograph on the genus Agave.)

Being a man, I think and speak as a man, but today I also speak for agave. As agave's advocate, I speak in the same spirit as the bumper sticker which says, "Have you thanked a green plant today?". I begin by reading a handsome paragraph from Prescott's history of the conquest of Mexico (3).

"But the miracle of nature was the great Mexican aloe, or maguey, whose clustering pyramids of flowers, towering above their dark coronals of leaves, were seen sprinkled over many a broad acre of the table-land . . . its bruised leaves afforded a paste from which paper was manufactured: its juice was fermented into an intoxicating beverage, pulque, of which the natives, to this day, are excessively fond: its leaves further supplied an impenetrable thatch for the more humble dwellings; thread, of which coarse stuffs were made, and strong cords, were drawn from its tough and twisted fibers; pins and needles were made of the thorns at the extremity of its leaves; and the root, when properly cooked, was converted into a palatable and nutritious food. The agave, in short, was meat, drink, clothing, and writing material, for the Aztec! Surely, never did nature enclose in so compact a form so many elements of human comfort and civilization!"

The uses of agaves are as many as the arts of man have found it convenient to devise. At least two races of men have invaded agaveland during the last ten to fifteen thousand years, where, with the help of agaves, they contrived several successive civilizations. The evolution of agave use ranges all the way from the coincidental and spurious, through tool and food-drink subsistance with mystical overlay, to practical specialities of modern industry and art. Perhaps, as the Aztec legends suggest (Goncalves (2) p. 72), it was the animals that first showed man the edibility of agave.

My aim here is to stress the theme of mutualism by two disparate organisms. At the cost of being somewhat anthropocentric, I mean to show as much of what agave did for man as what man did for agave. The main pageant of this symbiosis took place in Mexico, all the way in time from early hunting and gathering stages, through agriculture, and on into the city state stages of civilization.

The ancient Mexicans cultivated and coddled maguey incessantly. They cleared the wild land and put agave into it. They opened up a new and nurturing environment with varying habitats and ecologic niches for the random variants of the generich agave genus. The cultivators made agave a home on the deep productive soils and in time provided water and manure. They protected the plants from weedy trees. They selected the genetic deviates of high production by planting vegetative offsets. Agave species multiplied into more varieties than man has been able to characterize and count. This agricultural effort formed a social disciplined complex subservient to the agave symbiont.

Generally, that is what man did for agave in this Meso-American symbiosis.

In return agave has nurtured man. During the several thousand years that man and agave have lived together, agave has been a renewable resource for food, drink, and artifact. As man settled into communities, agave became fences marking territories, protecting crops, providing security, and ornamenting the home. Agave fostered in man the settled habit, attention to cultivation, and the steadfast purpose through years and life spans, all virtues required by civilization. As civilization and religion increased, the nurturing agave became a symbol, until with its stimulating juice man made a god of it. Agave civilized man. That is what agave did for man!

Food

Archaeology has shown us that in MesoAmerica man has been chewing on agave for at least nine thousand years. The evidence is classically epitomized in a report by Callen (1) in Economic Botany for 1965. By examining coprolites, he identified what man had been eating. Opuntia and agave cells appeared constantly from earliest midden levels to the present. They antedate cultivated maize and beans by several thousand years. From 9000 BP onward the use of agave is documented also by archeological specimens of "quids" (chewed fiber rejects), by artifacts made of fiber, and tools for their manufacture.

The main source of food in agave is the soft starchy meristem and the white bases of leaves. As the plant matures the starch and sugar content of these organs increases, as does their palatability. When cooked they become sweet and edible. Some species and varieties are more palatable than others; those with pungent or toxic compounds were generally known and avoided. The more sapogenous species were not domesticated. The young tender turgid flowering shoot of most species is edible. Other foods include the flowers of some species which are eaten boiled, or, more commonly, scrambled with eggs. Agaves also have use as food flavorings: pulque bread is still available in certain

Figure 1. A "pulquero" with his pulque-gathering equipment on the high plains of Puebla. Photo — HSG

Figure 2. Maguey basin where "the upwelling sap is held like a live spring".
Photo — HSG

towns; tortillas wrapped in agave cuticle or meat broiled in agave leaf wrapping have flavors imparted by these tissues.

Agaves in their native regions are very easy to grow. Just dig up an off-set, "hijo" the Mexicans say, carry it home and a week or a month later stick it in the garden. Right there it will replicate its parent vegetatively. —— I don't think it would be very much fun if we could replicate ourselves that way.

Early agriculturists doubtless selected only the sweet sorts for cultivation. Many evolving varieties and forms of agave species were selected by man, moved from place to place with him, and inadvertently crossed. As he lived with these varietal eventualities through the centuries, he was provided with new genetic combinations that he could check empirically for yield and quality of fiber, food, beverage, and other special products. All this sustained activity became a specialized subcivilization with its own vocabulary, its own toil, art, and customs.

Beverages

The beverages of agaves are of special interest because they affect the mind as well as the digestion. Agaves produce two distinct kinds of beverages. The first is drawn as sap from the living plants and consumed fresh as **agua miel** or fermented as **pulque.**[1] Pulque is comparable as intoxicant to our hard cider or beer. The second kind is the distilled liquors known as **mescal** and **tequila**, which were developed subsequent to European occupancy of Mexico. The Amerindian did not know distillation. The distilled liquors now comprise a modern industry of increasing economic importance. Pulque, however, has been produced since prehistoric times and has remained local or endemic in use. It is more important as a product which stimulated and nourished the cultivation of agave and became dynamic to ancient Mexican civilizations.

When the apex of a mature agave plant is cut out, a basin in the broad stem is formed among the live standing leaves.[2] The upwelling sap, held like a live spring in the heart of the huge maguey plants, is a ready source of sweet water for the sweating peasant and the weary traveler where potable water is scarce or absent. Fermentation will occur in the maguey

basins if sap is not collected daily. The nourishing sap of maguey was available in its varying forms to all country people in the region of its culture. Corn and beans provided a substantial basic diet of carbohydrates and proteins, while agave helped balance the diet with needed minerals, amino acids, and vitamins.

As the city states of Mexico developed, the priests became the ruling class and along with their rise agave juice infused the priestly mind and the sociality of the times. Judging from the Aztec codices and other chronicles, the priests laid out rules by which their subjects, both men and agaves, were governed. They possessed agave with seeming avidity, set up gods of pulque, and propitiated these and other gods with pulque.[3] They appropriated its use especially in their ceremonies, when inebriation was not only permissible but desirable. The puritans bedeviled alcohol, the Mexicans deified it, but both practiced rigid moral standards. Peterson in his history of ancient Mexico,[4] informs us about the Aztecs. To the sick especially privileged, and to people who had passed their fifty-second birthday three cups were allowed daily. But there were festivals when everyone might drink. If a person became drunk illegally, his hair was cut off the first time: on the second occasion his house was demolished: and the third time brought death to him as an incorrigible offender. This was in the disciplined state of the city.

Figure 3. Mayahuel, the goddess of maguey. One of the many Aztec depictions (*Codex Laud*).

Alcohol, the physiologists tell us, is a depressant, but its effects on the psyche of man are quite the reverse, because it releases individual responses generally inhibited by social habit. Quiet men become noisy; stupid men become brutish; hidden grudges and secret hopes become manifest; weakness or strength may be revealed in individuals where these characteristics were not hitherto suspected. Among many, alcohol is a palliative because it permits mental and psychic exercises not otherwise functional. It promotes fellowship and communication and many a bargain or arrangement is made today in the social office of the "cantina" or club. As a social catalyst, pulque appears to have fostered mental gyrations in a fanatical ruling priesthood with a pulque-based culture. Mayahuel, the principal goddess of maguey, became the surrogate that nourished the body, slaked the parched throat, relieved the duty pressures, exalted the spirit, provided at least temporary surcease from hard life, and, being god-like, protected the home. Altogether, this was another contribution of agave to man during the centuries of the symbiosis.

We see agave hosting man in a kind of social eroticism. The moral problem it poses as an inebriator has been argued for centuries, but were any case brought against agave itself, I am sure the court would find agave innocent. Man's problems are his own. Agave has been but a wheel of fortune, but one wonders how man would have civilized without the juice of the vine or the maguey. One thing is sure, man is a lone egocentric without a single other organism in the whole world to counsel him. To alleviate this shortage he set up his gods as counselors.

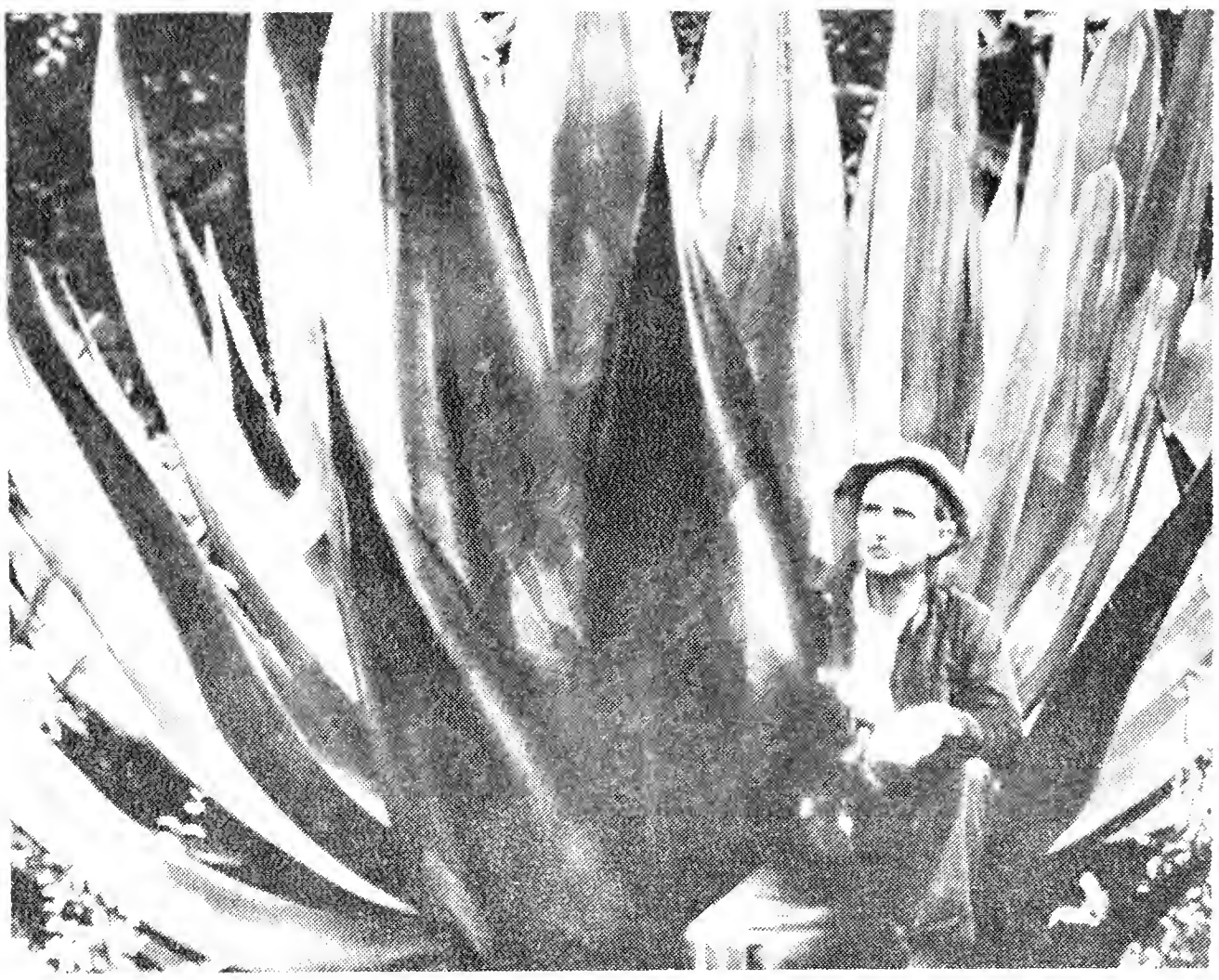


Figure 4. A son of Mayahuel in the arms of a giant maguey.

This is the last slide and it is time for the last truth. You see me held in the arms of this giant maguey. Actually, I am a son of Mayahuel, the goddess of maguey. What I have told you today is what she told me to tell you.

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SOMETHING THAT'S FUN

Putting our Garden's history together from data scattered through our records and files and scrapbooks will be a bit like solving a detective story plot, a bit like working out a jigsaw puzzle, and a bit like "Twenty Questions". It should be a fascinating job for a Volunteer who can give us a day or a half-day a week. Are you that Volunteer? Please phone us at 947-2800.

GARDEN ACTIVITIES

SEPTEMBER

Sun. 28th	Central Ariz. Cactus & Succulent Soc. Meeting	2.00 p.m.

OCTOBER

Sat. 4th	Field Trip—Silver Bell Mtn.	8:30 a.m.
Tues. 7th	CACTOMANIACS—Potluck Supper	6:30 p.m.
Sun. 26th	CAC&S Meeting	2:00 p.m.

1975-76 Program of Activities

DESERT BOTANICAL GARDENS

In Papago Park, Phoenix, Arizona

(Enter Garden from 5800 E. Van Buren or 6400 E. McDowell)

DESERT BOTANICAL GARDEN is open daily 9:00 A.M. to 5:00 P.M. including weekends and all holidays. Voluntary admissions help to support this non-profit Garden.

CLASSES in identification, propagation, and use of Desert Plants in landscaping are given Wednesdays at 2:30-4:00 P.M. from November thru April. Fee for the six week course is $10.00; members are free. Classes are held in Webster Auditorium.

ILLUSTRATED LECTURES, using colored slides, are given by Staff members each Thursday at 3 P.M. in the Garden's Webster Auditorium, November through April.

CACTOMANIACS is an informal group of persons interested in cacti, other desert plants, and related subjects. The group meets the first Tuesday of each month, October through May, in Webster Auditorium. You, too, are welcome. 8 p.m.

One-day FIELD TRIPS are taken the first Saturday of each month, October through May, to places of botanical interest. The group leaves the Garden's parking lot at 8:30 A.M., and returns about 4:45 P.M. Members free; non-members $1.00 each.

The CENTRAL ARIZONA CACTUS & SUCCULENT SOCIETY meets the last Sunday of each month at 2:00 P.M., in Webster Auditorium. This young group is affiliated with the CACTUS & SUCCULENT SOCIETY OF AMERICA, INC., and invites you to their meetings.

SEPTEMBER

sun.	**28th**	CENTRAL ARIZ C & SS—Meeting	**2:00 P.M.**

OCTOBER

Sat.	**4th**	FIELD TRIP—Silver Bell Mt.	**8:30 A.M.-4:45 P.M.**
Tues.	**7th**	CACTOMANIACS—Potluck Supper: Slides of AABGA—W. H. Earle	**6:30 P.M.**
Sun.	**26th**	CENTRAL ARIZ C & SS—Meeting	**2:00 P.M.**

NOVEMBER

Sat.	**1st**	FIELD TRIP—Sugar Loaf Mt.	**8:30 A.M.-4:45 P.M.**
Tues.	**4th**	CACTOMANIACS—Meeting	**8:00 P.M.**
Wed.	**5th**	CLASS—Deserts and Their Plants	**2:30 P.M.**
Thurs.	**6th**	ILLUSTRATED LECTURE—Arizona Cacti	**3:00 P.M.**
Wed.	**12th**	CLASS—Succulent Plants	**2:30 P.M.**
Thurs.	**13th**	ILLUSTRATED LECTURE—Arizona Wildflowers	**3:00 P.M.**
Wed.	**19th**	CLASS—Culture of Succulent Plants	**2:30 P.M.**
Thurs.	**20th**	ILLUSTRATED LECTURE—Arizona Trees & Shrubs	**3:00 P.M.**
Wed.	**26th**	CLASS—Identification of Desert Trees & Shrubs	**2:30 P.M.**
Thurs.	**27th**	THANKSGIVING DAY	
Sun.	**30th**	CENTRAL ARIZ C & SS—Meeting	**2:00 P.M.**

DECEMBER

Tues.	**2nd**	CACTOMANIACS—Meeting	**8:00 P.M.**
Wed.	**3rd**	CLASS—Culture of Desert Trees & Shrubs	**2:30 P.M.**
Thurs.	**4th**	ILLUSTRATED LECTURE—Arizona Birds & Animals	**3:00 P.M.**
Sat.	**6th**	FIELD TRIP—Castle Hot Springs	**8:30 A.M.-4:45 P.M.**
Wed.	**10th**	CLASS—Field Trip: Blue Wash	**8:30 A.M.-4:15 P.M.**
Thurs.	**11th**	ILLUSTRATED LECTURE—Mexican Cacti	**3:00 P.M.**
Thurs.	**18th**	ILLUSTRATED LECTURE—Western Australian Wildflowers	**3:00 P.M.**
Thurs.	**25th**	CHRISTMAS DAY	
Sun.	**28th**	CENTRAL ARIZ C & SS—Meeting	**2:00 P.M.**

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8-9-75

1975-76 PROGRAM OF ACTIVITIES

JANUARY

Thurs.	1st	NEW YEAR'S DAY	
Sat.	3rd	FIELD TRIP—Painted Rock Dam	8:30 A.M.-4:45 P.M.
Tues.	6th	CACTOMANIACS—Meeting	8:00 P.M.
Wed.	7th	CLASS—Deserts . . Their Plants	2:00 P.M.
Thurs.	8th	ILLUSTRATED LECTURE—Arizona Cacti	3:00 P.M.
Wed.	14th	CLASS—Succulent Plants	2:30 P.M.
Thurs.	15th	ILLUSTRATED LECTURE—Arizona Wildflowers	3:00 P.M.
Wed.	21st	CLASS—Culture of Succulent Plants	2:30 P.M.
Thurs.	22nd	ILLUSTRATED LECTURE—Arizona Trees & Shrubs	3:00 P.M.
Sun.	25th	CENTRAL ARIZ C & SS—Meeting	2:00 P.M.
Wed.	28th	CLASS—Identification of Desert Trees & Shrubs	2:30 P.M.
Thurs.	29th	ILLUSTRATED LECTURE—Arizona Birds & Animals	3:00 P.M.

FEBRUARY

Tues.	3rd	CACTOMANIACS—Meeting	8:00 P.M.
Wed.	4th	CLASS—Culture of Desert Trees & Shrubs	2:30 P.M.
Thurs.	5th	ILLUSTRATED LECTURE—Mexican Cacti	3:00 P.M.
Sat.	7th	FIELD TRIP—White Tanks Mt.	8:30 A.M.-4:45 P.M.
Wed.	11th	CLASS—Field Trip: Cave Creek Dam	8:30A.M.-4:15 P.M.
Thurs.	12th	ILLUSTRATED LECTURE—Western Australian Wildflowers	3:00 P.M.
Wed.	18th	Deadline for CACTUS SHOW Art Entries	5:00 P.M.
Fri.	20th	All other CACTUS SHOW Entries received today and until 1:00 P.M. on the 21st	
Sun. thru Sun.	22nd 29th	29th ANNUAL CACTUS SHOW	Daily 9-5 P.M.

MARCH

Tues.	2nd	CACTOMANIACS—Meeting	8:00 P.M.
Sat.	6th	FIELD TRIP—Fish Creek Canyon	8:30 A.M.-4:45 P.M.
Wed.	10th	CLASS—Deserts . . Their Plants	2:30 P.M.
Thurs.	11th	ILLUSTRATED LECTURE—Arizona Cacti	3:00 P.M.
Wed.	17th	CLASS—Succulent Plants	2:30 P.M.
Thurs.	18th	ILLUSTRATED LECTURE—Arizona Wildflowers	3:00 P.M.
Wed.	24th	CLASS—Culture of Succulent Plants	2:30 P.M.
Thurs.	25th	ILLUSTRATED LECTURE—Arizona Trees & Shrubs	3:00 P.M.
Sun.	28th	CENTRAL ARIZ C & SS—Meeting	2:00 P.M.
Wed.	31st	CLASS—Identification of Desert Trees & Shrubs	2:30 P.M.

APRIL

Thurs.	1st	ILLUSTRATED LECTURE—Arizona Birds & Animals	3:00 P.M.
Sat.	3rd	FIELD TRIP—Peralta Canyon	8:30 A.M.-4:45 P.M.
Tues.	6th	CACTOMANIACS—Meeting	8:00 P.M.
Wed.	7th	CLASS—Culture of Desert Trees & Shrubs	2:30 P.M.
Thurs.	8th	ILLUSTRATED LECTURE—Mexican Cacti	3:00 P.M.
Sat.	10th	SALE OF UNUSUAL PLANTS	9-5 P.M.
Sun.	11th	SALE OF UNUSUAL PLANTS	9-5 P.M.
Wed.	14th	CLASS—Field Trip: Pinnacle Peak	8:30 A.M.-4:15 P.M.
Thurs.	15th	ILLUSTRATED LECTURE—Western Australian Wildflowers	3:00 P.M.
Thurs.	22nd	ILLUSTRATED LECTURE—Arizona Cacti	3:00 P.M.
Sun.	25th	CENTRAL ARIZ C & SS—Meeting	2:00 P.M.
Thurs.	29th	ILLUSTRATED LECTURE—Arizona Wildflowers	3:00 P.M.

MAY

Sat.	1st	FIELD TRIP—Box Canyon	8:30 A.M.-4:45 P.M.
Tues.	4th	CACTOMANIACS—Pot Luck Supper	6:30 P.M.
Sun.	30th	CENTRAL ARIZ C & SS—Meeting	2:00 P.M.

June 27th, July 25th, August 29th, 1976
CENTRAL ARIZONA CACTUS & SUCCULENT SOCIETY MEETINGS

No CLASSES or LECTURES are given from May through October, but the GARDEN is open daily. For any additional information, phone 947-2800.

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SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

Vol. XXIX October, 1975 No. 8

REG MANNING

SAGUAROLAND BULLETIN

Published and owned by the Arizona Cactus and Native Flora Society, sponsors of the Desert Botanical Garden of Arizona, P.O. Box 5415, Phoenix 85010. The Saguaroland Bulletin is published to disseminate information on the Garden and on desert plants and their culture. Issued 10 times a year. Annual subscription including membership, $10.00.

Editor, W. Hubert Earle Associate Editor, Lillian Diven

Volume XXIX October, 1975 No. 8

Arizona Cactus and Native Flora Society

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COVER: Fruit-laden branch of Atamisquea

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Editor's Notes

The mid-September BOARD MEETING dealt with some important changes. Membership fees were increased for the first time since 1959. We were very reluctant to follow the lead of almost all other institutions, but the great increase in our basic operating expenses has made this change necessary if we are to survive. In the last two years alone, our taxes have more than doubled, insurance is up over 30 percent, the increased cost of utilities is a real burden, maintenance supplies — from paint to replacement parts — cost more than three times what they did, and even the cost of service calls — electricians, plumbers, etc. — has increased substantially.

John H. Eversole, who had been Board Chairman since 1948, tendered his resignation. Board members elected John Rhuart as his replacement, and elected Mildred May president, and Tom Goodnight treasurer. Angela Bool, Board Secretary since 1951, also resigned. Lillian Mieg was elected to that position.

Four new Board members were appointed for three-year terms. They are Naomi Kitchell, Henry Triesler, Eric Maxwell and W. T. Chester.

Beginning in October, Board meetings will be held at the Garden's Richter Library on the third Thursday of every month at 2:30 p.m. These will be open meetings, and Garden members will be welcome to attend them.

GARDEN ACTIVITIES for 1975-76 were listed on the card you received with your last issue of the Bulletin. Elsewhere in this issue you will find details of the year's field trips. The Cactomaniacs, though still maniacs (?) about cactus, are interested in other plants, too, so this year staff members Rodney Engard and Sherry Couch will each talk about a variety of topics the Cactomaniacs should find interesting. Rodney's subjects will include growing wildflowers, preparing plants for the Cactus Show, Grow-Lux growing tubes, and more. Sherry will handle indoor gardening — ferns, bulbs, dish gardens — and outdoor subjects such as vegetable gardens. Both speakers will be glad to answer your questions. There will be a feature speaker at each meeting, too. The informal Cactomaniacs invite all interested people to attend their meetings on the first Tuesday of every month at 8:00 p.m. here at the Garden.

This year's Thursday afternoon series of illustrated lectures will be shorter than usual, because Christmas and New Year's Day both come on Thursday. There won't be lectures on those two holidays or on Thanksgiving Day. Of course the Garden will be open on all holidays as well as every other day of the year.

The AABGA (American Association of Botanical Gardens and Arboreta) held its Annual Meeting in September on the island of Kauai, Hawaii. The cool trade winds were thoroughly enjoyed by your Editor, a refugee from the hot desert summer.

Officials of over 75 institutions, without neglecting the meetings, lectures and

(Continued on page 89)

Reprinted from Phytochemistry, 1975, Vol. 14, pp. 291-292. Pergamon Press. Printed in England.

PILOCEREINE FROM LOPHOCEREUS SCHOTTII FORMAE MONSTROSUS AND MIECKLEYANUS*

LESLIE G. WEST and JERRY L. McLAUGHLIN
Department of Medicinal Chemistry and Pharmacognosy,
School of Pharmacy and Pharmacal Sciences,
Purdue University, West Lafayette, IN 47907, U.S.A.
and
W. HUBERT EARLE
Director, The Desert Botanical Garden of Arizona,
P.O. Box 5415, Phoenix, AZ 85010, U.S.A.
(Received 28 May 1974)
Key Word Index—Lophocereus; Cactaceae; cactus alkaloids; pilocereine.

Plants. Cuttings of *Lophocereus schottii* (Engel.) Br. & R. (the "senita cactus"), *L. schottii* forma *monstrosus* Gates (the "totem pole cactus"), and L. *schottii* forma *mieckleyanus* G. Lindsey, as described by Lindsey(1). *Source.* From authenticated plants growing in the Desert Botanical Garden of Arizona, Papago Park, in Phoenix, Arizona. *Previous work.* The presence of tetrahydroisoquinoline alkaloids in the genus *Lophocereus* is well documented(2-6).

Present work. A re-examination of *L. schottii,* using previously reported TLC screening(7,8), indicated no appreciable amounts of new alkaloids. Similar screening of two previously uninvestigated monstrose forms, *L. schottii* forma *monstrosa* and *L. schottii* forma *mieckleyanus,* showed identical alkaloid content. However, *L. schottii* forma *mieckleyanus* was quantitatively richest in alkaloids. $CHCl_3$ extraction and ion-exchange chromatography(7) of 775 g of freeze-dried, pulverized, and defatted *L. schottii* forma *monstrosus* yielded 74 mg of pilocereine (m.p. 175-176°, m.m.p. 174-175°; lit. 174-175°, IR, 0.01 percent yield) after refrigeration of the phenolic alkaloids in Et_2O and recrystallization from EtOAc. Surprisingly the non-phenolic fraction also contained pilocereine which substantiates the earlier reports of the cryptophenolic nature of this compound(3).

An identical extraction was conducted with 885 g of *L. schottii* forma *mieckleyanus.* Separating the alkaloids on neutral alumina (activated for 2 hr at 137°) with C_6H_6-Et_2O (1:1). Crystallization from EtOAc yielded 23 mg of pilocereine (m.p. 174-175°, m.m.p. 173-174°, reference m.p. 174-175°, IR, 0.005 percent yield). Lophocerine and traces of unidentified alkaloids were observed by TLC in the phenolic alkaloid fractions of all three plants. Due to the small quantities observed, attempts to crystallize additional alkaloids were not made.

Biological significance. The presence of alkaloids in these spineless monstrose plants imparts a disagreeable bitter taste, as well as known pharmacotoxic effects(9), and quite likely has a protective value to the plants in repelling hungry rodents and other animals.

Acknowledgments—The authors thank Dr. C. Djerassi for reference pilocereine and Dr. J. M. Bobbitt for reference lophocerine sulfate. L. G. West acknowledges the support of the James F. Hoge Memorial Fellowship from the American Foundation for Pharmaceutical Education. This work was supported by grants from the Purdue University Cancer Research Committee (Indiana Elks), the National Institutes of Health (General Research Support Grant No. RRO-5586), and the Cactus and Succulent Society of America.

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*Part XXV in the series "Cactus Alkaloids." For Part XXIV see Vanderveen, R. L., West, L. G. and McLaughlin, J. L. (1974) *Phytochemistry* 13, 866.

EDITOR'S NOTES

(Continued from page 87)

seminars, enjoyed a week of visiting the lush gardens of the Garden Island, and marvelling at the vast displays of tropical plants. Half day trips were made to a number of botanic gardens, private estate gardens, Kokee State Park, Waimea Valley, Kalalau Lookout and its Awaawapuhi Trail, and the Foster Botanical Garden and Lyon Arboretum on the island of Oahu.

Kauai boasts the wettest place in the world, the windward side of Mount Waialeale, where four to six **hundred** inches of rain fall annually. The leeward side of the island is the "dry" side — only 100 inches of rain. But the volcanic soil is very porous, so this part of the island is slightly arid and supports imported century plants and cacti. A curiosity of the "dry" side was a four-foot-high violet — the bush **Viola trachelilifolia.** Another plant caused me to do a doubletake. At the University of Hawaii experimental farm on Kauai was a plot of Jojoba (**Simmondsia chinensis**) from our own desert. The year-old plants were already 18 inches tall and 24 inches wide. It takes three or four years for our plants to reach that height.

On Kauai, too, I saw the black-flowered Bat Flower, **Tacca chantrieri.** Slides of it and other plants will be shown at the October Cactomaniacs meeting.

Rabbit Report: our two-mile-long perimeter fence, reinforced with layer on layer of diminishing sizes of wire mesh, is a success. We have been having biweekly rabbit drives, shifting the population of those critters out of the Garden through a temporary opening in the fence. The rabbit count has diminished to the point where we drove only six rabbits out during our last drive — counts for the first drives were about fifty rabbits. The desert is still very dry, and the rascals relished our succulent cacti. Now the ejected rabbits are feasting on the fairways of two adjacent golf courses, and our cacti have a chance to survive.

NEW MEMBERSHIP DUES

As explained in the Editor's Notes, the Garden has been forced to raise dues in some of the membership categories.

Starting this month, Individual Membership is $10.00 a year, and Family Membership is $15.00 a year. Other memberships, which are listed on page 86, remain unchanged for the present.

Desert Trees and Shrubs

ATAMISQUEA
Atamisquea emarginata Miers

Capparidaceae
Caper Family

Atamisquea emarginata could easily be mistaken for **Celtis reticulata** in Arizona, as the growth habits and general appearance of both plants are remarkably similar when viewed from a distance. Although Atamisquea grows to a 7-meter tree in parts of its range, Arizona specimens rarely reach a height of 4 meters, and form dense, divaricately-branched shrubs which are usually wider than they are tall. Distribution of this monotypic genus in the United States is limited to southwestern Pima County in Arizona, around Quitobaquito Springs in the Organ Pipe National Monument. In Mexico it is known in Baja California from San Ignacio south, from the Arizona border south to central Sonora, from Tiburon Island, and perhaps Sinaloa. It occurs also in Argentina and Chile. Its North American habitat is between 1000 and 1500 feet elevation in the Lower Sonoran Desert. It is normally found on dry, gravelly plains and bajadas among creosote bush and its associates, particularly along dry arroyos.

These dense shrubs have brittle, ill-smelling wood and foliage. The dark-green leathery leaves are alternate on the stems. The silvery undersurface is lepidote (scurfy). It bears unusual fringed scales shaped like very small open umbrellas on short stems. The simple leaves are linear to oblong-linear, entire, emarginate at the apex, short-petiolate, and from 1 to 3.5 cm long.

The small solitary or fasciculate sweet-scented flowers appear in March and April

(Continued on page 92)

A thicket of *Atamisquea emarginata* at Quitobaquito Springs in the southwest corner of Organ Pipe National Monument.

ASPECTS OF OUR GARDEN

A Prickly Pear Cactus from southern California, *Opuntia vaseyi* (*O. occidentalis* var *vaseyi* or *O. littoralis* var *vaseyi*) is a prostrate plant with salmon to reddish-apricot flowers. Here at the Garden it blooms in May. A Prickly Pear which may be *O. vaseyi* has been found in northern Arizona.

on short, new, golden-colored branches which turn dirty gray with age. The flowers are 7 to 8 mm in diameter. Authors disagree on flower structure. Either the number of floral parts is variable, or petals and sepals are extraordinarily alike. As interpreted by one author, petals number 6 in unequal pairs; by another author, 4 in unequal pairs. The petals are about 8 mm long and linear-lanceolate with lepidote scales on the outside surface, and glabrous within. Sepals number 2 in an unequal pair or 4 in unequal pairs, depending on interpretation. Shreve and Wiggins report the outer sepals as being 6 to 7 mm long, lepidote within and pilose without. The inner pair they report as being spathulate.

Interpretation of the androecium seems even more in question. Fertile stamens are reported variously as 6 or 9, with 1 to 3 or 1 to 6 alternating staminodes.

The gynecium consists of an ovary enveloped in a torus on a 4-to-8 mm stipe. The stigma is sessile. The fruit is unilocular with 4 parietal placentae. The gray-green, scaly, 8 mm long ovoid-to-subglobose and somewhat fleshy fruit is drupelike and contains 2 seeds or 1 by abortion. The seeds are partially enclosed by a coral-pink, pulpy aril.

We know nothing of the culture or horticultural potential of this plant, and we can find no record of its ever being cultivated. Fresh seed has been collected by the Garden staff for the first time, and it is hoped that the plant will be established in the Garden within a few years.

The pink fruit of *Atamisquea emarginata*. Photograph taken in August, 1975.

FIELD IDENTIFICATION: A hackberry-like shrub to be found only in the area of Quitobaquito Springs. The narrow, leathery, dark-green leaves do not have the toothed edges of the Hackberry. Lepidote scales, visible with a hand lens, are present on fruit, young branches, perianth, and undersides of leaves. Crushed parts of plant are ill-smelling. Seeds are surrounded by pink pulpy aril.

REFERENCES

Benson & Darrow, Trees and Shrubs of the Southwestern Deserts
Kearney & Peebles, Arizona Flora
Shreve & Wiggins, Vegetation and Flora of the Sonoran Desert
Standley, Trees and Shrubs of Mexico

—RGE

THIS YEAR'S FIELD TRIPS

With the last issue of the BULLETIN you received the Garden's Program of activities for the coming fall, winter and spring. Here are details about the eight monthly field trips that are, for many Garden Members, the major not-to-be-missed dates on our calendar.

This year we'll go to five locations we've never before had field trips to. The other three locations — Sugarloaf Mtn., Fish Creek Canyon, and Peralta Canyon — are popular field trip goals we schedule every other year, so even if you participated in all of last year's field trips, you can look forward to eight new trips this year.

SILVERBELL MOUNTAIN area is where we'll go on October 4th. West of the Phoenix-Tucson highway and southwest of Picacho Peak, this is the northernmost location of **Jatropha cardiophylla**, a

handsome shrub with glossy dark-green foliage that is called Sangre de Cristo or Sangre de Drago. This is also the location of the one-building ghost town of Sasco. The trip from Phoenix is approximately 80 miles one way. Only moderate hiking will be involved.

On November 4th the field trip is to SUGARLOAF MOUNTAIN on Sycamore Creek northeast of Saguaro Lake. We'll see some interesting perennial vegetation on the mesas and the distinctive riparian vegetation along the Creek. This is an excellent birding location, too. Easy hiking. About 80 miles round trip.

CASTLE HOT SPRINGS for the December 6th trip. The area is east of Wickenburg, northwest of Carl Pleasant Lake. This is volcanic desert with a big wash whose vegetation is the intermittent-stream type. Moderate hiking over moderately rough ground. 130 miles round trip from Phoenix.

January 3rd is to a new area, PAINTED ROCK DAM, west of Gila Bend. It is a flood-control reservoir that fills only occasionally, but this year there's a lot of water behind the dam and we might find adventive plants, their seeds washed in by the rains from the mountains. At the north end of the adjacent Painted Rock Mountains we may find elephant trees, and there is a slight chance of spotting the first wildflowers of 1976. Moderate hiking. 160 miles round trip drive.

Another new area, WHITE TANK MOUNTAINS, is scheduled for February 7th. They are due west of Phoenix, and get their name from the white granite "tanks" or natural rock basins where water collects. Probably there will be expanses of the yellow-flowered Bladder-pod **Lesquerella gordoni.** Only moderate hiking involved. Driving about 80 miles round trip.

In March, the field trip heads for FISH CREEK CANYON on the 6th. It's about halfway along the Apache Trail, that narrow, tortuous, but perfectly safe road that terrifies "flatlanders" and the faint of heart. For the rest of us, it's a favorite trip for early spring wildflowers, since we're almost sure to see lots of Dudleyas in bloom, Desert Mallow, Penstemons, Phlox, and the gorgeous Mariposa Lilies. A little hiking, though on rough terrain. The round trip from Phoenix to Phoenix is about 90 miles.

PERALTA CANYON is the destination on April 3rd. At the base of the Superstition Mountains, this is a fine place for wildflowers in dry years and a spectacular place when we've had any rain at all. Reports in past years have recorded 50 or more species in bloom on just one spring day here. A three-mile hike on the narrow, steep but good trail into the canyon is planned. Round trip mileage is about 100 miles. (Make reservations good and early for this popular trip.)

The year's last field trip, to BOX CANYON, will be held on May 3rd. This is in the Mineral Hills south of Florence Junction. The area is very scenic and geologically fascinating. Jojoba and the interesting shrub Crossosoma are found here. A longish hike is planned. The round trip drive is about 150 miles.

RESERVATIONS ARE REQUIRED FOR ALL FIELD TRIPS. Please telephone the Garden at 947-2800. Field trips leave the Garden's parking lot promptly at 8:30 a.m. and return usually no later that 4:45 p.m. Be sure to bring along your lunch and drinking water.

Please note: There is no charge to Garden Members, but all non-members pay a fee of $1.00 per person. (And since field trips leave the Garden before our shop opens, and the trip leader will carry no change, participants should be sure to bring the right amount.)

CHANGE OF ADDRESS

To insure getting the Bulletin, please be sure to notify the Garden six weeks **before** you move.

Arizona Wildflower

CRYPTANTHA
Cryptantha barbigera
Boraginaceae
Borage Family

If there is a special heaven for field botanists and amateur flower-watchers, every wildflower there will be easy to identify. The Cryptanthas won't be present.

This is a tricky genus in a family that can only be identified with certainty by looking at the fruits (nutlets) through a high-powered microscope for a long time.

About the Borage Family, Kearney and Peebles says, "In many cases it is very difficult to recognize the genus and almost impossible to obtain a precise identification of the species if the specimens lack mature fruiting structures."

Rickett comments, "One experienced botanist has said that one has perhaps a 20 per cent chance of naming (a species) correctly."

And readers of the Bulletin may well ask at this point, "They why bother about it at all?"

The answer is that Cryptanthas are among the most common spring wildflowers, and next spring you are going to come across lots of something that looks sort of like a small Fiddleneck with white flowers instead of yellow, and isn't a Popcorn Flower, and you'll wonder what it is.

You can be reasonably sure it is a Cryptantha **IF**:

1. It has tiny one-sixth inch white forget-me-not flowers in bristly, tightly-coiled spirals.
2. The whole plant, narrow leaves and stems, is covered with sharp, stiff hairs.
3. The plant is usually under six inches tall (though it may grow to 16 inches).
4. You find it in the creosote bush desert from March through June.
5. AND IF — it looks like this picture.

If it checks with all the above, you can't be totally sure it's a Cryptantha, but you can be sure it probably is one.

(Continued next page)

A life-sized photograph of *Cryptantha barbigera*. Other Cryptanthas resemble it very closely. Despite the small size of the flowers, it is an attractive plant.

Book Review

A FIELD GUIDE TO THE COMMON AND INTERESTING PLANTS OF BAJA, CALIFORNIA, Jeanette Coyle and Norman C. Roberts, Natural History Publ. Co., 1975, paperbound, $8.50. 206 plus ix pp., color photos, drawings.

The title and price of this lavishly printed handbook might imply a more complete treatment of the Baja California flora than it is in fact. This does not mean that the book is a disappointment. On the contrary, we can recommend it highly to anyone who plans a trip to Baja. The price is necessary to pay for the color photographs which appear opposite the text concerning each plant. Many of these are excellent and a great help to the amateur in determining the plant in hand. No keys are provided beyond the family level. The families are numbered and appear in order in the book. A list of the plants included in each family aids in locating the text and illustration. A phytogeographic list is given for each habitat. Two pages of illustrations of basic botanical terminology will help the non-specialist interpret the text descriptions. A glossary of botanical and Spanish names will also be helpful in this respect. A bibliography and a general index are included.

Other helpful features for the traveling naturalist in Baja California are sections on physiography, climate, geology, and descriptions of phytogeographic regions. Short discussions of endemism and regions of origin and distribution are presented as an introduction to the flora. Many of these headings also include short bibliographic references.

The text is clear and readable. A short description with ecological, distributional and ethnobotanical notes is presented. Some large groups, such as Opuntia, are dealt with under the genus with notes on only a few species. Available at our Bookstore, $8.75 postpaid. —RGE

ARIZONA WILDFLOWER

(continued)

As for which species, forget it. That quotation from Rickett mentions a 20 per cent chance. Actually, in Arizona there are ten creosote-bush-desert species of Cryptantha, so you have a 10 per cent chance of hitting on the right one.

The species, *C. barbigera,* is identified by nutlets that are lanceolate with rounded or obtuse unthickened margins, the back not angulate, dull. For all practical purposes, we suggest you simply jot in your notebook "Cryptantha??" and proceed to the next wildflower.

REFERENCES

Kearney & Peebles, Arizona Flora
Rickett, Wild Flowers of the United States, Vol. 4

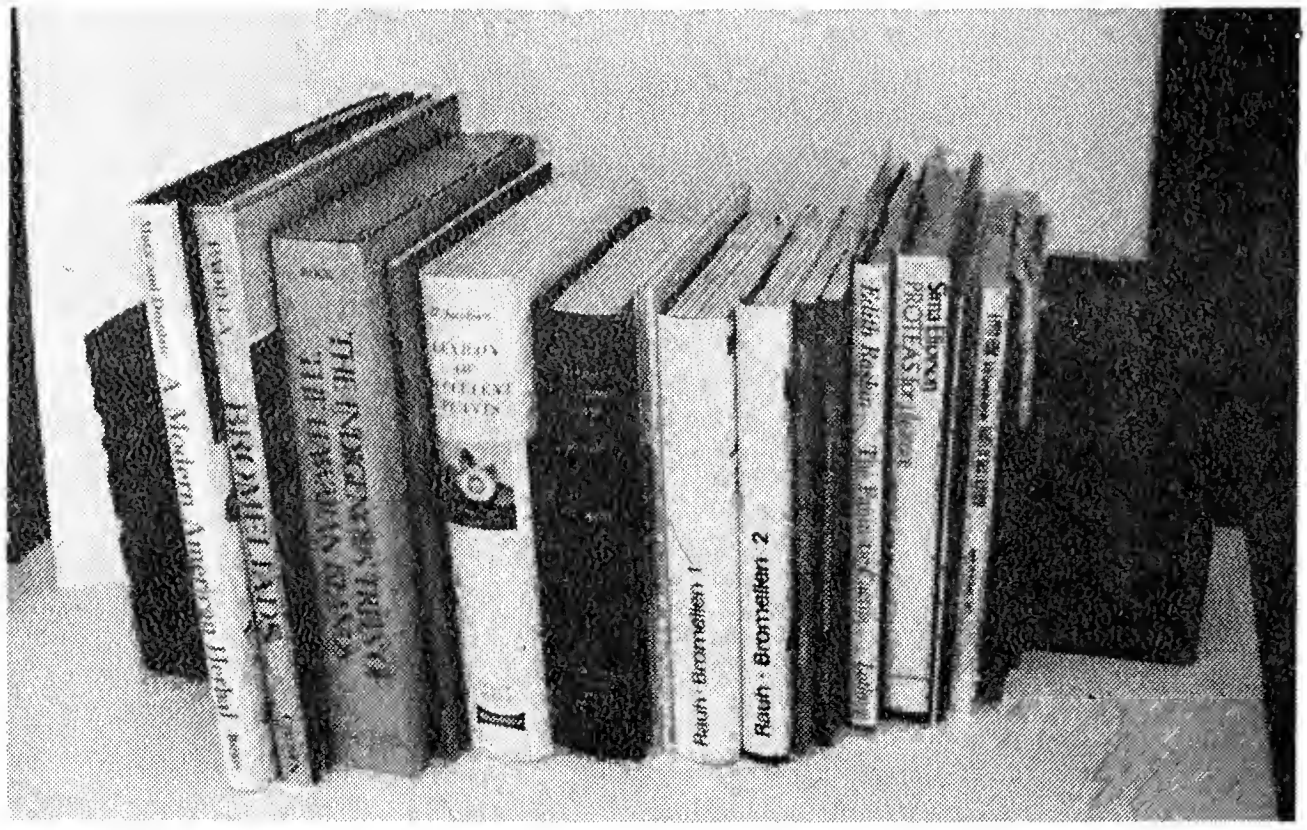
—LD

VOLUNTEERS NEEDED

Fall means the start of our busiest season at the Garden, the time when your help is most needed and most appreciated.

We need assistance in the library, for a number of office jobs, and VERY URGENTLY, in the bookstore.

Will you give as a half-day or a full day each week? Please phone the Garden at 947-2800 and tell us when you can come.



AMONG THE BOOKS recently received in our Library are: Jacobsen's "Lexicon of Succulent Plants", the standard in its field, only recently translated from the German. Two books on bromeliads — Rauh's two-volume "Bromelien" in German, and Padilla's "Bromeliads" in English. Raskin's "The Fantastic Cactus". "A Field Guide to the Common and Interesting Plants of Baja California", by Coyle and Roberts (reviewed in this issue). St. John's "List of the Flowering Plants of Hawaii". The new edition of Rock's classic "Indigenous Trees of the Hawaiian Islands" (the Garden owns a copy of the rare first edition). Brewerton's "The Succulent Euphorbias". Marx and Dugdale's "Modern American Herbal". "Landscaping with Native Arizona Plants", compiled by the Soil Conservation Society. "Succulents, a Glossary of Terms and Descriptions", by Ivimey-Cook. An excerpt from this last book will be published in the November Bulletin.

GARDEN ACTIVITIES

		OCTOBER	
Sat.	**4th**	FIELD TRIP—Silver Bell Mt.	**8:30 A.M.-4:45 P.M.**
Tues.	**7th**	CACTOMANIACS—Potluck Supper: Slides of AABGA—W. H. Earle	**6:30 P.M.**
Sun.	**26th**	CENTRAL ARIZ C & SS—Meeting	**2:00 P.M.**
		NOVEMBER	
Sat.	**1st**	FIELD TRIP—Sugar Loaf Mt.	**8:30 A.M.-4:45 P.M.**
Tues.	**4th**	CACTOMANIACS—Meeting	**8:00 P.M.**
Wed.	**5th**	CLASS—Deserts and Their Plants	**2:30 P.M.**
Thurs.	**6th**	ILLUSTRATED LECTURE—Arizona Cacti	**3:00 P.M.**
Wed.	**12th**	CLASS—Succulent Plants	**2:30 P.M.**
Thurs.	**13th**	ILLUSTRATED LECTURE—Arizona Wildflowers	**3:00 P.M.**
Wed.	**19th**	CLASS—Culture of Succulent Plants	**2:30 P.M.**
Thurs.	**20th**	ILLUSTRATED LECTURE—Arizona Trees & Shrubs	**3:00 P.M.**
Wed.	**26th**	CLASS—Identification of Desert Trees & Shrubs	**2:30 P.M.**
Thurs.	**27th**	THANKSGIVING DAY	
Sun.	**30th**	CENTRAL ARIZ C & SS—Meeting	**2:00 P.M.**

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

Vol. XXIX November, 1975 No. 9

REG MANNING

SAGUAROLAND BULLETIN

Published and owned by the Arizona Cactus and Native Flora Society, sponsors of the Desert Botanical Garden of Arizona, P.O. Box 5415, Phoenix 85010. The Saguaroland Bulletin is published to disseminate information on the Garden and on desert plants and their culture. Issued 10 times a year. Annual subscription including membership, $10.00.

Editor, W. Hubert Earle Associate Editor, Lillian Diven

Volume XXIX November, 1975 No. 9

Arizona Cactus and Native Flora Society

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COVER: Yellow flower of Heterotheca subaxillaris

Desert Botanical Garden of Arizona

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Garden Open Daily 9 a.m. to 5 p.m. including holidays

ANNUAL MEMBERSHIP: Individual $10.00, Family $15.00, Sustaining $25.00, Benefactor $50.00, Elementary or High School Student $2.00. LIFE MEMBERSHIP $100.00. FOUNDER MEMBERSHIP $500.00.

Editor's Notes

The building of another 700 feet of 1" water line from our 3" main line through the Garden gives us better access to water needed for trees and shrubs and acacia areas. The proximity of this new line enabled us to run 300' of ¾" pipe to the south and east boundary of the Succulent House so that we could build 5 large beds for aloe plants recently imported from South Africa, and for aloes from central & eastern Africa raised from seed. This will, in 2 to 3 years, make an extensive splash of color for our visitors, and plants for botanical study.

The impressive beds were built by our staff with immense black basalt rocks we hauled into the Garden three years ago.

The roofs on the Richter Library and the Herbarium proved to have been inadequately surfaced during construction, and began to spring leaks as the paper buckled, so it was necessary to have a contractor install new roofing for $1580 in August. We could not afford to have rain ruin our irreplaceable books, or damage our herbarium specimens.

The staff applied aluminum paint to the roofs of the Administration Building and the apartment, Archer House, Rest Room Building, and two sets of carports. This application will help retain the oil in the roofing paper, and reflect the sun in the summer.

Summer maintenance duties also consisted of painting the trim, etc. on the Archer House, trim and inside of the Visitors-Bookstore Building, and concrete walls; building new shelves for the Herbarium, and countless hours in the summer's hot sun watering, planting, and caring for new and established plants.

Sherry Couch, our plant accessionist, has catalogued almost all our present plants, and is beginning to prepare identification signs for those plants of particular interest; she will also continue to identify those in bloom for the many visitors, students and botanists.

Wildflower seeds are now being sown at the Garden, and they will need continual watering until they get up to good size. Wildflower seed packets were given to Cactomaniacs at their October meeting, so we should see many more spots of color through the city this winter and spring. Wildflower seeds can be planted until the middle of November in our valley, and are available at the Garden's Bookstore for 25c a packet.

Rabbit Report No. 3 The continued dry period, now about 20 months, is causing our remaining rabbits to eat cacti they have never touched before. Each drive shows a diminishing number evicted, but they are getting 'cagey', and have to be pried out of their hiding spots. The last drive showed 8 Jackrabbits, and we feel there are only about the same number left in our 150 acres. By the way, these 'drives' consist of the rabbits being directed to a large opening in the fence where they hop into the City park area.

Several gifts of cash have been given to the Garden; these and other gifts will be reported at the end of the year. This is a good time of the year for you to review your finances, and give a gift to the Garden, as it will be tax-deductible. We have a long list of needs at the Garden which you would possibly enjoy reviewing, and then donating to one of the needs.

Many new Australian Eucalyptus seedlings have been planted during October in our Eucalyptus grove. Some of those planted last spring are now six feet tall.

Wednesday, November 5th, at 2:30 p.m., is the beginning of our fall courses in the study, identification and propagating of desert plants, wildflowers, trees and shrubs, and cacti. There will be a fall class, winter class, and spring class. Enrollment is $10.00 per person (members free), which will also include booklets, plants, and tours of the Garden. Mark this on your calendar.

Illustrated lectures on desert subjects begin November 6th, at 3:00 p.m. Bring your friends to these free lectures.

Arizona Wildflower

TELEGRAPH PLANT
Heterotheca subaxillaris

Compositae
Sunflower Family

This conspicuous roadside annual is 2 to 6 ft. tall. Most commonly, there is one principal stem branching only near the top and spreading, like a telegraph pole with its crossbars.

The coarse, hairy stems and leaves give off a strong odor when crushed, the reason for its other name of "Camphor Weed."

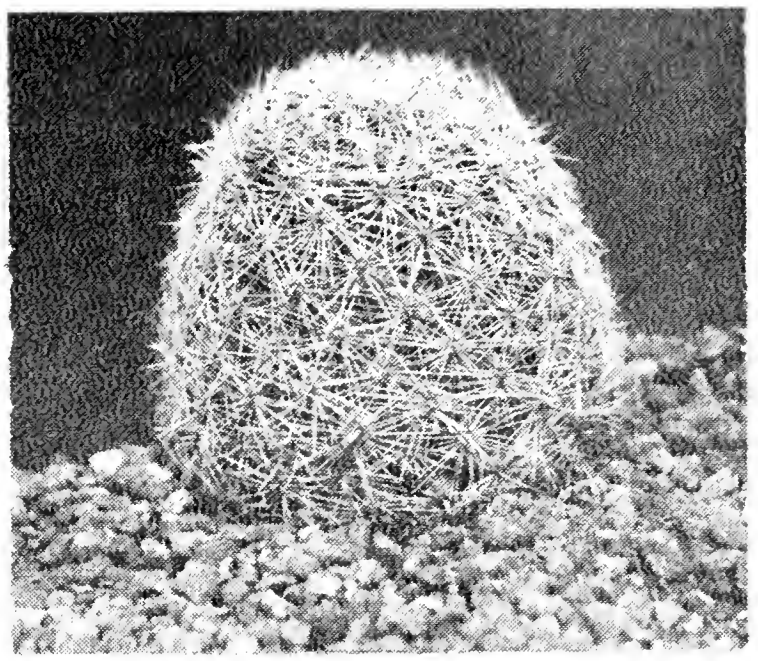
From March to November, but largely in late summer, it is abundant in Arizona along roadsides, on ditchbanks, in sandy washes, wherever it can get moisture, at 100 ft. to 5500 ft. elevations. Elsewhere it is found from Delaware to Florida and west and south to Arizona and Mexico. The clear yellow flower heads are ¾ of an inch across.

REFERENCES
Kearney & Peebles, Arizona Flora.
Parker, Arizona Ranch, Farm and Garden Weeds.

Multiple stems occur when the Telegraph Plant receives a superabundance of water.

Arizona Cactus

OLIVE'S PINCUSHION
Mammillaria oliviae
Cactaceae



A mature plant of *Mammillaria oliviae* about 10 cm tall.

This is a most attractive small globose white cactus that can be handled easily because its central spines are short and (except in rare cases) unhooked.

It was first found by Orcutt in 1902 west of Vail (southeast of Tucson), and has since been located in Pima, Santa Cruz and Cochise Counties, and in Sonora, Mexico.

The simple, cespitose body, which is globose to short-cylindrical, is 6 to 7 cm wide and up to 10 cm high. Tubercles, arranged in 13 to 21 spirals, are very firm in texture, dull gray-green, four-sided. They measure 6 to 10 mm in length, 5 mm in width. Areoles are inverted pyriform, bearing short wool, later becoming naked. Axils have a light tuft of wool, but no bristles.

Central spines are 1 to 3 and white, the lower one 3 mm long and porrect, the upper 9 mm long, acicular, and horizontal with the radials. Radial spines 25 to 35, 6 mm long, straight, snow white, and spread at right angles to the stem.

Funnelform flowers, pink, 2 to 3 cm long and wide, usually appear in July. Outer perianth segments greenish below, with reddish-brown mid-stripe, linear-lanceolate, with acuminate tip, ciliate margins. Inner perianth segments rose, with rose-pink margins, lanceolate, with acute tip, entire margins. Filaments rose to magenta, anthers yellow, style white to pink-rose, stigma lobes olive green. Fruit scarlet, clavate, to 25 mm long, edible. Seeds black, pitted but glossy, globular or obovate, with slightly extending ventral hilum, 9 mm by 6 mm.

The plant often intergrades with **Mammillaria microcarpa**, in which case hooked spines will be found mixed with the short, white centrals.

M. oliviae is found in rocky and gravelly soils in the desert and lower grasslands, up to 900 meters elevation.

The taxonomy of this plant has an amusing aspect. Orcutt showed the newly-collected cactus to a barmaid in a Tucson tavern. She admired it and its discoverer gallantly promised to name it after her — so it became **Mammillaria oliviae** for Miss Olive, the barmaid. At least that's the story I heard thirty years ago from old-time botanists.

This is a fine plant for your collection, with simple cultural requirements, although it will need shade at lower elevations. Seedlings are most attractive. They will flower at four years of age, with pink flowers comparatively large for the size of the plant.

Type Locality: West of Vail, Arizona.

Distribution: Low mountains and deserts of central and southern Arizona.

REFERENCES

Benson, Cacti of Arizona
Britton & Rose, Cactaceae
Craig, Mammillaria Handbook
Earle, Cacti of the Southwest

—WHE

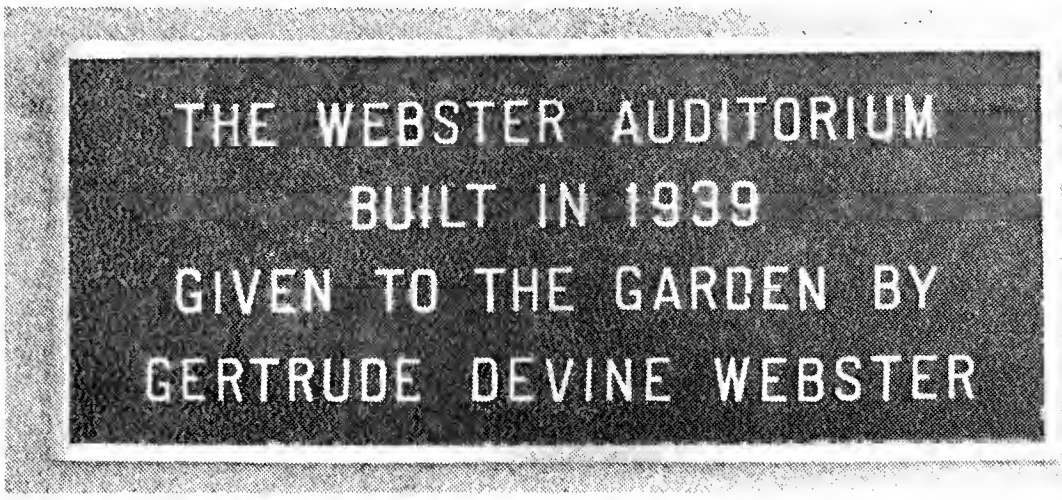
OWL KACHINA made by Bill Sewemaenewa of the Hopi Indian Reservation and given to the Garden by Alice Feffer. This unusual 16" Kachina is on display in the Garden's Richter Memorial Library.

ASPECTS OF OUR GARDEN

Beavertail Prickly Pear (Opuntia basilaris) is found in the open desert and foothills of southwestern Arizona from the Colorado River eastward to Wickenburg. Its magenta-red flowers are eye openers in the months of April and May. The pads are shaped like the tail of a beaver, hence its common name.

GARDEN BUILDINGS IDENTIFIED

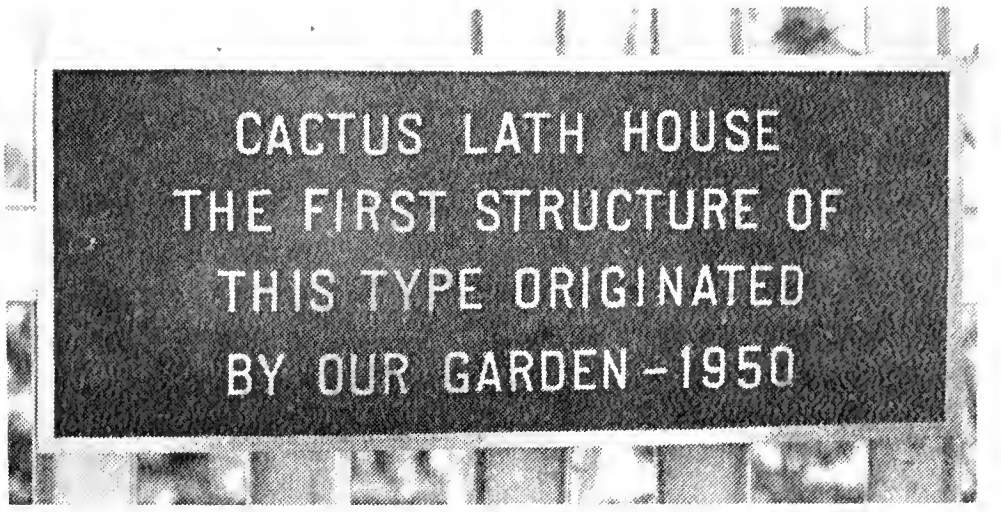
Over the years, as the Garden has grown, we have realized that there should be some permanent identification of the various buildings and other major features of the Garden. Recently we had ten bronze plaques made and installed. They include dates, builders and donors of the different constructions, information we are proud to share with members and visitors.



Construction of this Auditorium and Administration Building began 1937.

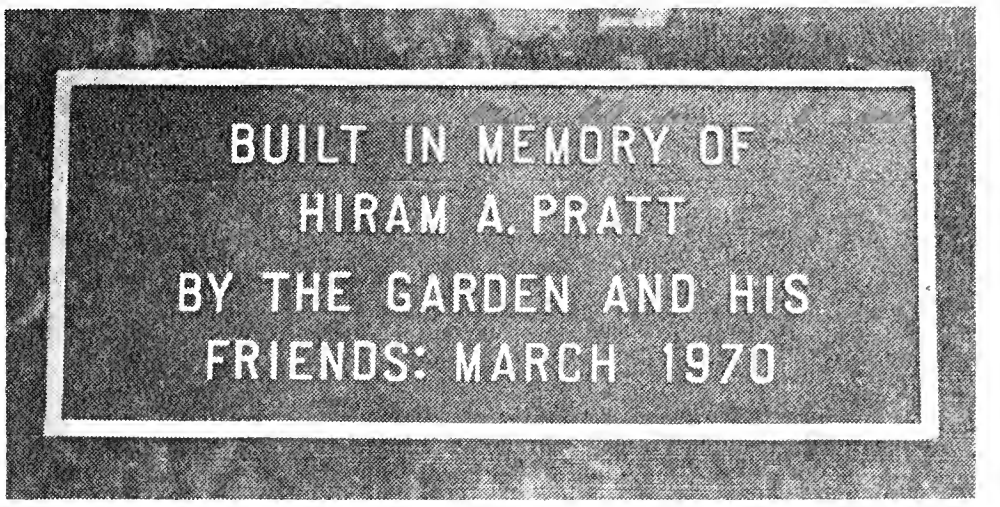
Our handsome wrought-iron entrance gates realize an idea that "Charlie" held for many years.

Now being used by our Research Botanist.

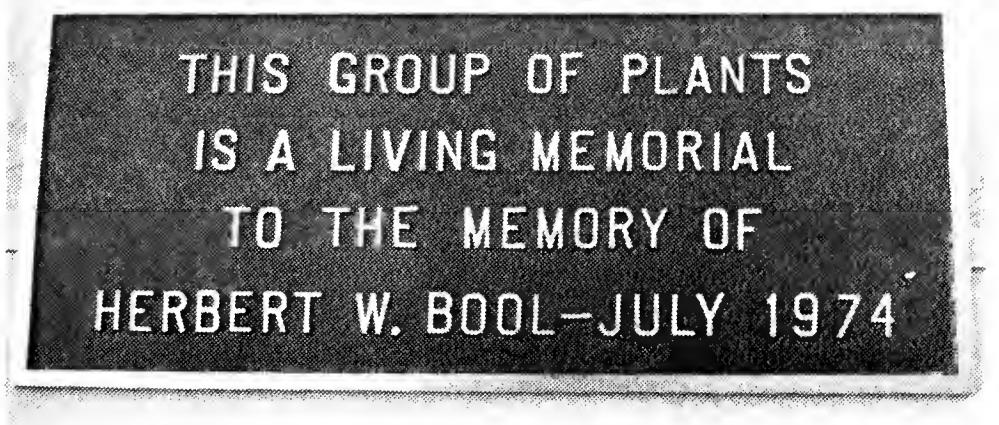


Our late director W. T. Marshall undertook the building of this structure for tender cacti.

Delicate Stapelias, Lithops, Euphorbias, and other succulents can **be grown only here.**



The view from this hillside ramada includes the whole Garden and surrounding mountains.



To commemorate the memory of the grower of this outstanding collection of cacti.

NEW PLANTS IN THE GARDEN

The official name of this Garden's parent organization is The Arizona Cactus and Native Flora Society, Inc., though many people think we are interested in only cactus and succulents. Our interest in native and exotic desert non-succulent plants has been a serious one since 1958. Over the years the Garden has been instrumental in introducing into the nursery trade a number of Arizona desert natives and exotics, now common in desert gardens. The process of introducing natives to the trade is a slow one.

The Garden staff collects seeds and cuttings of likely plants. We divide the material between our own propagating area and an experienced nurseryman — in recent years, Ron Gass of the Mountain States Wholesale Nursery. There is an advantage in this: the plants are grown in two separate locations, and the nursery-trade potentialities are better evaluated.

In mid-October, Mr. Gass delivered 100 potted plants (in one-gallon cans) that are the result of our combined work. Ten of the species represented are Arizona natives that look to us like exciting additions to desert gardens. There are also two Texas species and a large group of young eucalyptus, grown from seed the Garden received from Australia.

A brief description of some of the plants follows. If you are interested in any of them, you can see them here at the Garden, and if you decide to buy any, your nurseryman can order them from the Mountain States Wholesale Nursery in Paradise Valley, Arizona.

Melampodium leucanthum, the Honey Flower or Blackfoot Daisy, is a fragrant white daisy, low enough to make an attractive ground cover in a wildflower bed. The flowers are long-lasting.

Jacobinia ovata, one of the several "hummingbird bushes", is a spring-flowering shrub much like Anisacanthus. Flowers are orange-red and flowering is profuse. Same family as Beloperone, and equally popular with hummingbirds. (You should make a note of the botanical names of plants you want to order, to be sure of getting the one you want.)

Zauschneria latifolia, another "hummingbird bush" is even more attractive than the preceding one. It is a sub-shrub to two feet, has a larger, redder flower with exserted stamens.

Penstemon eatonii is a species with scarlet tubular flowers. A graceful plant, and one the humming birds will like, too.

Penstemon pseudospectabilis has larger flowers than **P. eatonii**, and the ruffled foliage is appealing.

Salvia mojavensis, collected in the Harquahala Mountains, is a very green compact shrub. The heads of light blue flowers are like those of the familiar Chia, but larger and showier. It stays in bloom for about two months. Foliage is aromatic.

Two Daleas — **Dalea parryi** and **D. wislizenii** are also new to the trade. Both have silky hairs on the foliage. Blue-lavender flowers in spikes at the tips of the branches. Nice semi-open low shrubs.

Sphaeralcea ambigua, the familiar Desert Mallow, is represented by three new color forms that are much prettier than the common orange-yellow. Flowers of one of the new Sphaeralceas are a lovely rose-pink.

Atriplex lentiformis, or Quail Bush, is a most useful saltbush for desert gardens. It makes a fine background plant or hedge, takes the fullest sun, provides color contrast with its silver-gray foliage, and — as the name implies — is a favorite with quail.

A small tree, **Rhamnus californica**, native to our whole state, and referred to as the coffee-berry tree, has a light coating beneath its leaves.

Two Texas natives promise to be beautiful plants that should do well here:

Salvia greggii is a small shrub with glowing rose-red flowers similar in shape to Jacobinia and Beloperone. In our desert, better plant it where it gets a little shade.

Diospyros texana is a highly decorative persimmon. A dense, dark-green shrub or small tree, it bears typical persimmon fruit 1½ to 2 inches in diameter. Frost is needed to make the fruit palatable to humans, but we imagine wildlife will be less critical.

Besides these plants, the 18 species of eucalyptus just received are of special interest to the Garden. "Eucs" cross-pollinate very easily, but these were grown for the most part from seed the Garden obtained from pure stands of the different species in their native Austrailia. Some promise to be very attractive trees, but only a prolonged "field test" here at the Garden will separate the outstanding ones from the average.

If any of these new plants interest you, you're welcome to come to the Garden and see how they look. Just phone first to be sure someone on the staff is available to show you where they are located.

The Garden's Development Program includes both large and small projects which we'd like to bring to your attention. May we remind you that every dollar you give to the Garden is tax-deductible? The projects that form our Development Program are: An additional parking lot; construction of six Aloe beds; improvement of entrance gate area; blacktopping of service road; erection of a plant sales building; blacktopping of garden paths; an addition to the Visitors' Building-Bookstore; additional wheelchairs for visitors; industrial-size labelling machine; trash receptacles; Nature Center Reception Building; two Nature Trail bridges; two electric drinking fountains.

Information on separate projects will appear in succeeding issues of the BULLETIN. For details of any project, please telephone the Director, 947-2800.

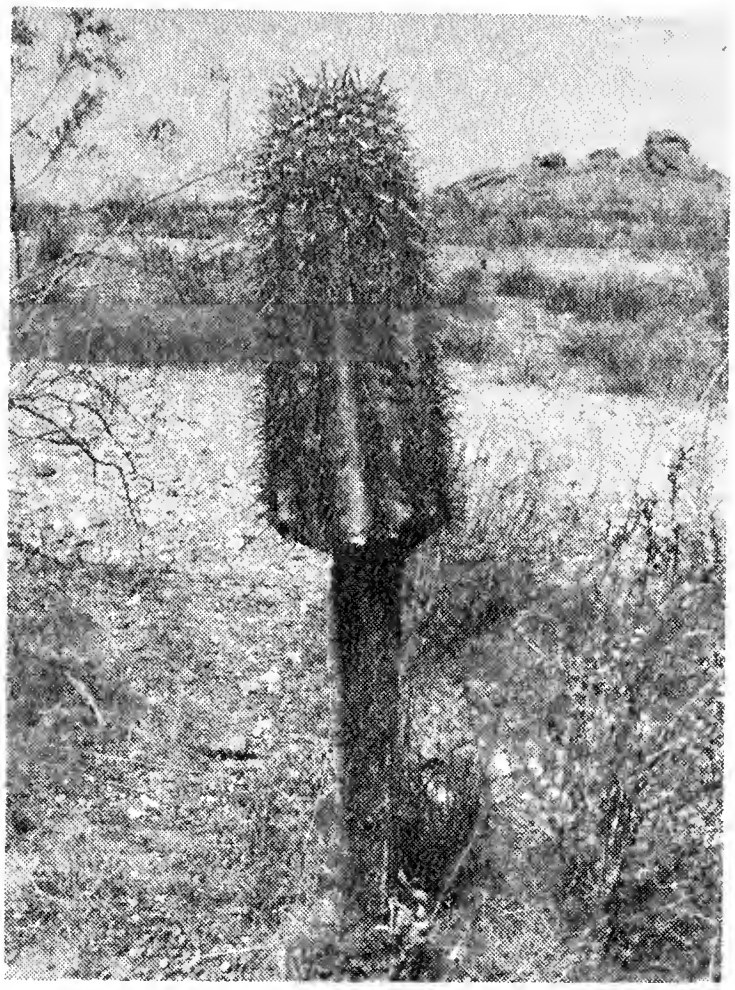
YOU CAN HELP US BUILD —

AN ADDITIONAL PARKING LOT. Our current parking lot, 600 x 200 ft., has been enlarged three times since 1960. Visitors to the Garden have increased from 15,000 annually in 1958 to 150,000 in 1974. A row of parked busses that have brought groups of club members or convention delegates is a common sight. Since the Garden is not tax-supported, and derives the great part of its income from visitors' contributions and purchases, a new parking lot is a high-priority project.

The proposed location of the new parking lot is north of, and parallel to, our current one. This location means that visitors will have to walk a minimum distance to the Garden's entrance.

Projected cost of a 600 x 200 ft. parking lot $1,500

YOUR GIFT OF FUNDS FOR THIS DEVELOPMENT PROJECT IS TAX-DEDUCTIBLE. WILL YOU HELP DEFRAY ALL OR PART OF THE COST?



I'm just a young Saguaro about 35 years old and am most thankful that the Garden has built a fence to keep out the rabbits. You can see they were eating me alive. Thanks!

GARDEN ACTIVITIES

NOVEMBER

Sat.	1st	FIELD TRIP—Sugar Loaf Mt.	8:30 A.M.-4:45 P.M.
Tues.	4th	CACTOMANIACS—Meeting	8:00 P.M.
Wed.	5th	CLASS—Deserts and Their Plants	2:30 P.M.
Thurs.	6th	ILLUSTRATED LECTURE—Arizona Cacti	3:00 P.M.
Wed.	12th	CLASS—Succulent Plants	2:30 P.M.
Thurs.	13th	ILLUSTRATED LECTURE—Arizona Wildflowers	3:00 P.M.
Wed.	19th	CLASS—Culture of Succulent Plants	2:30 P.M.
Thurs.	20th	ILLUSTRATED LECTURE—Arizona Trees & Shrubs	3:00 P.M.
Wed.	26th	CLASS—Identification of Desert Trees & Shrubs	2:30 P.M.
Thurs.	27th	THANKSGIVING DAY	
Sun.	30th	CENTRAL ARIZ C & SS—Meeting	2:00 P.M.

DECEMBER

Tues.	2nd	CACTOMANIACS—Meeting	8:00 P.M.
Wed.	3rd	CLASS—Culture of Desert Trees & Shrubs	2:30 P.M.
Thurs.	4th	ILLUSTRATED LECTURE—Arizona Birds & Animals	3:00 P.M.
Sat.	6th	FIELD TRIP—Castle Hot Springs	8:30 A.M.-4:45 P.M.
Wed.	10th	CLASS—Field Trip: Blue Wash	8:30 A.M.-4:15 P.M.
Thurs.	11th	ILLUSTRATED LECTURE—Mexican Cacti	3:00 P.M.
Thurs.	18th	ILLUSTRATED LECTURE—Western Australian Wildflowers	3:00 P.M.
Thurs.	25th	CHRISTMAS DAY	
Sun.	28th	CENTRAL ARIZ C & SS—Meeting	2:00 P.M.

GIFTS For CHRISTMAS

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PRICE LIST

Prices quoted include mailing in the United States. Add 10% for all foreign orders. Terms: Check, Draft or Money Order with your order. Please do not request C.O.D.

*Garden Publication, subject to dealer and library discounts.

BOOKS FOR THE SUCCULENT PLANT ENTHUSIAST

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BOOKS OF GENERAL DESERT INTEREST

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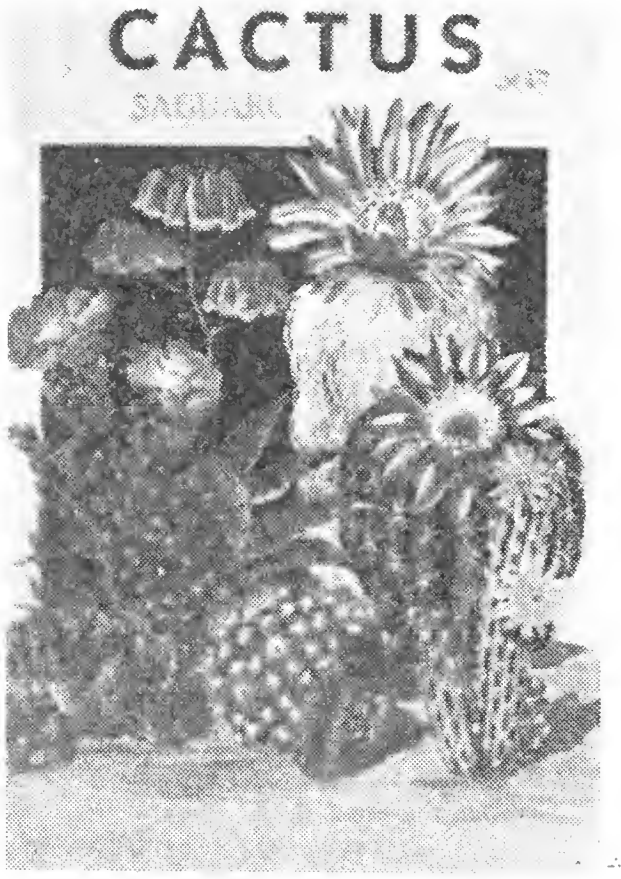

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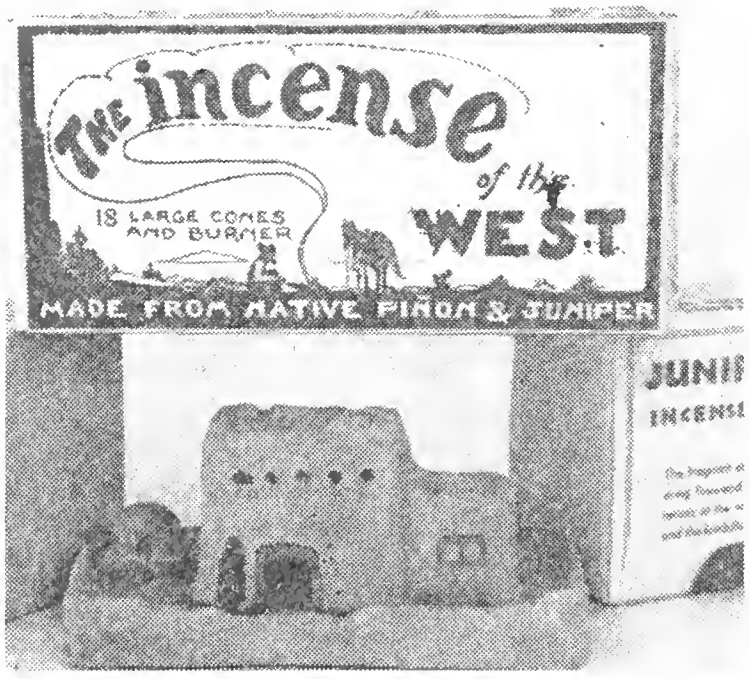

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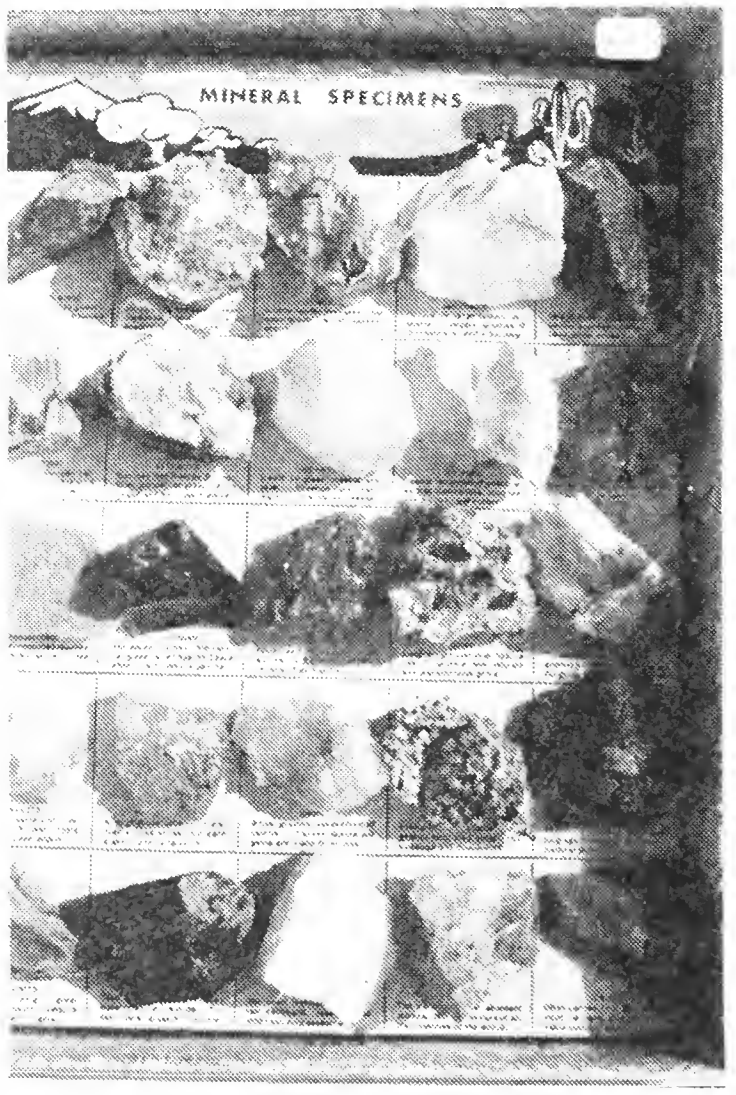
MINERALS



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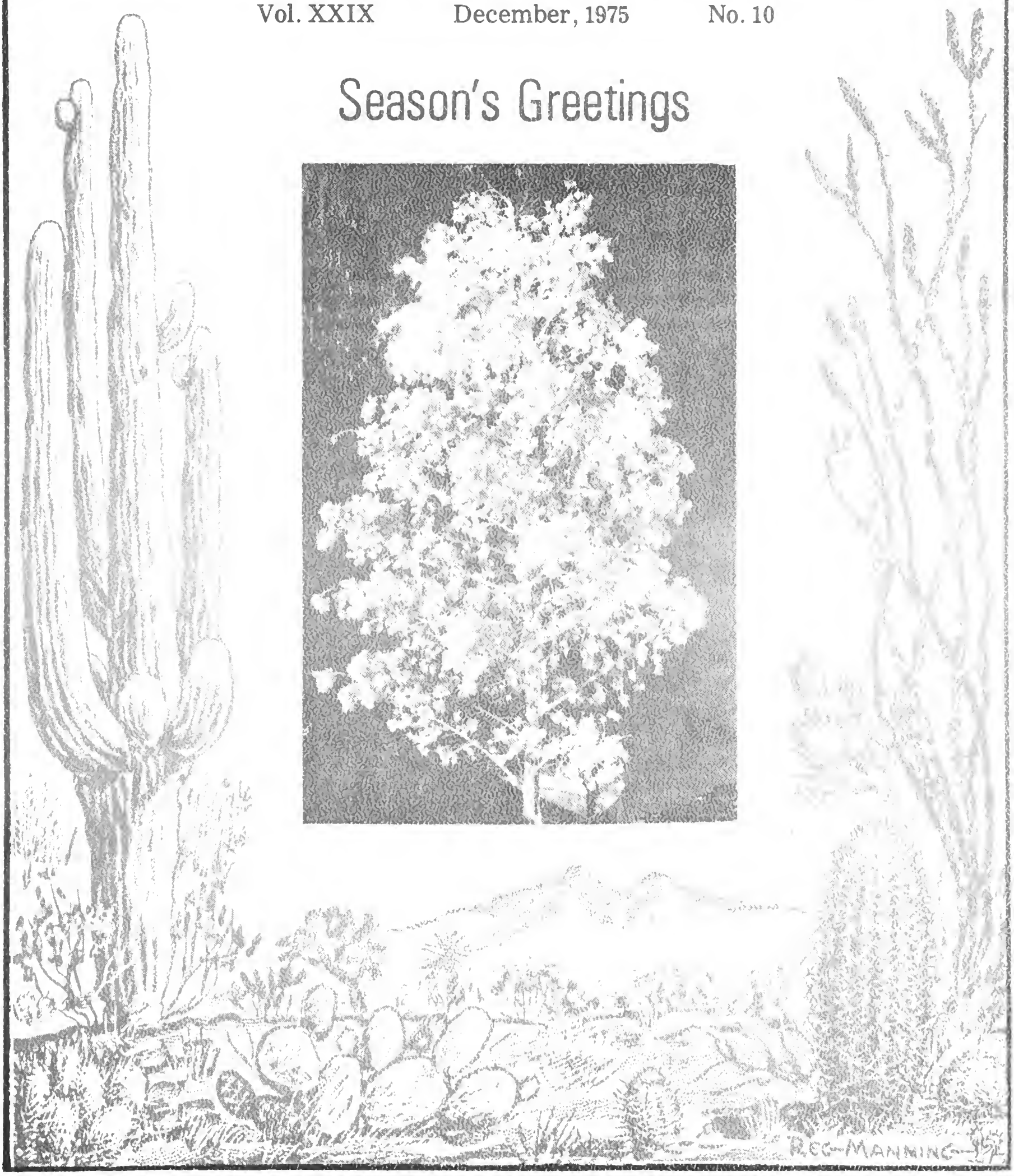
SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

Vol. XXIX December, 1975 No. 10

Season's Greetings



SAGUAROLAND BULLETIN

Published and owned by the Arizona Cactus and Native Flora Society, sponsors of the Desert Botanical Garden of Arizona, P.O. Box 5415, Phoenix 85010. The Saguaroland Bulletin is published to disseminate information on the Garden and on desert plants and their culture. Issued 10 times a year. Annual subscription including membership, $10.00.

Editor, W. Hubert Earle Associate Editor, Lillian Diven

Volume XXIX December, 1975 No. 10

Arizona Cactus and Native Flora Society

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Cover: *Nolina bigelovii* 'Beargrass'

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Superintendent . . . . . Rodney G. Engard
Curator of Herbarium . . . . . J. Harry Lehr
Assistant Horticulturists . . . . . Russell Haughey, Tom Caldwell
Secretary . . . . . Anne Amacker
Bookkeeper . . . . . Janice Moats
Bookstore . . . . . Ann Shelstad, Lela Turner
Maintenance and Bookstore . . . . . Lynn Trainum, Donald C. Shelstad
Plant Accessions . . . . . Sherry Couch
Student Horticulturist . . . . . John Moresco

Garden Open Daily 9 a.m. to 5 p.m. including holidays

ANNUAL MEMBERSHIP: Individual $10.00, Family $15.00, Sustaining $25.00, Benefactor $50.00, Elementary or High School Student $2.00. LIFE MEMBERSHIP $100.00. FOUNDER MEMBERSHIP $500.00.

Holiday Greetings from 1405 of us —

14 on the Garden Staff:

W. H. Earle, Howard Gentry, Rodney Engard,
Lynn Trainum, J. Harry Lehr, Anne Amacker,
Russ Haughey, Tom Caldwell, Ann and Don Shelstad,
Lela Turner, Sherry Couch, John Moresco, and Janice Moats.

18 Garden Volunteers:

Peg Gill, Lillian Diven, Elizabeth Fritz,
Dorothy Carson, Mary Hale, Lee Staver, Mildred Hunt,
Margaret Jenkins, Margaret Caldwell, George Anderson,
Harriet Bonney, Virginia Spangler, Carl and Eleanor Groschke,
Vera and Fred Starbuck, Ruby Gold, and Virginia Sanger.

and 1373 Garden Members —

all wishing you the best for 1976!

Arizona Wildflower

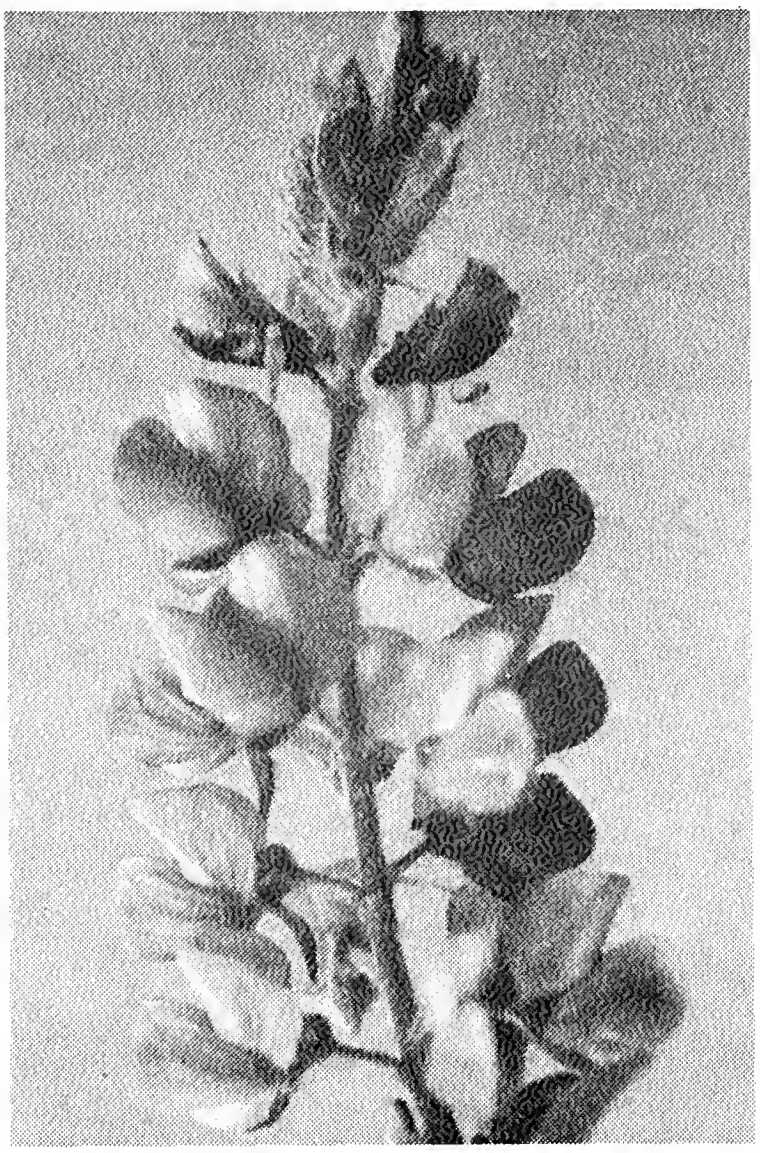
SILVERY LUPINE
Lupinus argenteus
Leguminosae
Pea Family

Of Arizona's twenty or more species of lupine, **L. argenteus** is the one you're most likely to see in the higher elevations (7,000 to 10,000 ft.) of the northern counties.

The showy flowers are a rich deep blue. However, when you find a large stand of Silvery Lupine, it is very likely that there will be one plant that has pure white flowers. This albinism is characteristic of lupines, and the ratio of white to normal blue flowers is apparently constant. You may find a group of all-blue plants, or a solitary white plant, but never a group of all-white, and rarely more than one, at the very most two, white in a field of blues.

Stems and the upper surfaces of the leaves of this lupine are more or less densely covered with silky silver-white hairs, a handsome contrast to the blue flowers and a convenient aid to identification.

Please note the "more or less" in the last sentence. Lupines vary greatly within a species, and this species is so variable that some authorities think it should be broken up into several separate species. Among the eighteen sheets of **L. argenteus** in our



Flowers of *Lupinus argenteus*

28" tall plant of *Lupinus argenteus*

Herbarium are plants that are densely hairy, ones that are somewhat hairy, and others that are only sparsely hairy. Leaf size is equally variable. The five-to-nine radiating leaflets are sometimes one inch long and sometimes over two inches. The average leaflet size is 1½ inches in length and slightly under ¼ inch at the greatest width. Height, of course, varies according to the food and moisture the individual plant gets.

With all these variables, though, Silvery Lupine is not hard to identify in northern Arizona. The points to keep in mind are the silvery hairs on the leaves, the altitude, and the deep blue of the flowers. **L. palmeri**, the only northern lupine at all similar to **L. argenteus**, is found lower, at 4,000 to 7,000 ft. elevations.

L. argenteus is found from North Dakota and Montana south to New Mexico and northern Arizona, blooming from June to early October (generally in August) in open coniferous forests.

REFERENCES

Kearney & Peebles, Arizona Flora
Rickett, Wild Flowers of the United States, Vol. IV

—LD

HOLIDAY DECORATIONS

This year we're using Beargrass, **Nolina bigelovii**, for our Christmas Trees. (See cover photo.) BULLETIN readers may remember that the Garden staff tries — and has fun trying — to use a different desert plant every Christmas. When we saw how attractively the creamy dried seed pods decorate the tall flowering stalk of Nolina, we wondered why we hadn't chosen this "tree" before.

Beargrass, in the Lily Family, resembles a clump of long-bladed grass, and like the Agaves sends up a single long flowering stalk. Unlike the Agaves, however, it doesn't die after flowering. The stalks are four to eight feet high. The flowers are tiny — it's the seed pods that make Nolina beautiful, as you'll see when you visit the Garden during the holidays.

GARDEN DEVELOPMENT PROJECT NO. 2

YOU CAN HELP THE GARDEN—

—Assign more workers to jobs connected with plants. FOUR LARGE TRASH RECEPTACLES, placed along the Garden's paths, will save our staff an estimated forty hours a week in "housekeeping chores"—raking, sweeping and picking up after the general public. It has been shown that people will use trash receptacles if the receptacles are conspicuous and strategically located, despite what pessimists think.

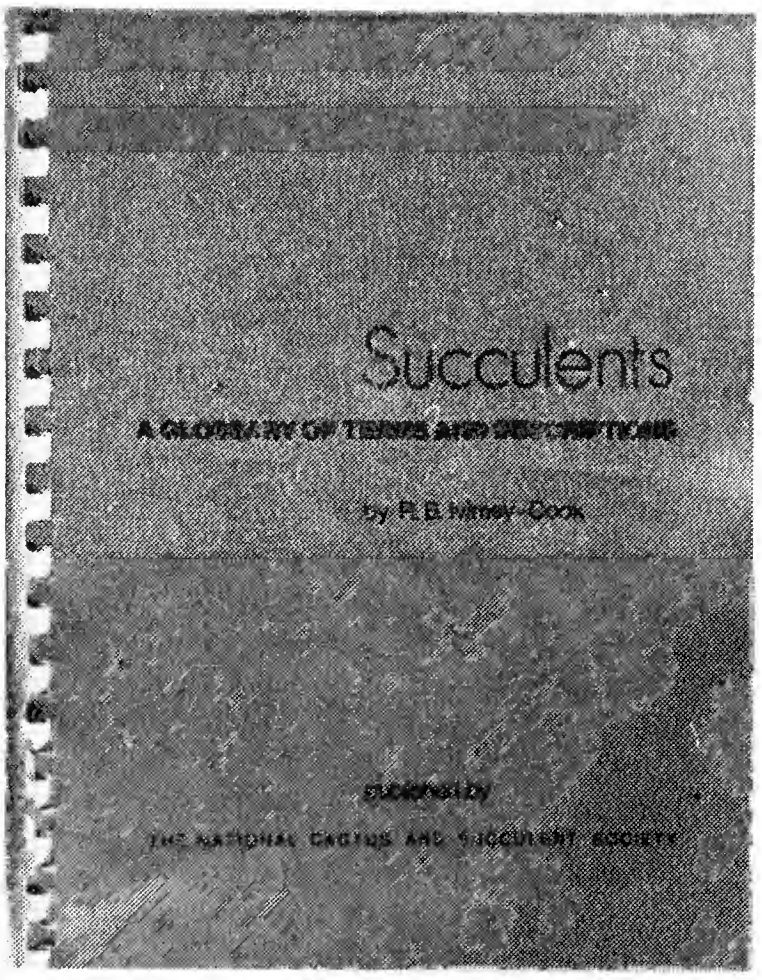
Unglamorous though Project No. 2 is, it is one that will help the Garden use its limited staff and limited time much more efficiently.

Projected cost of four large permanent receptacles $200.00

YOUR GIFT OF FUNDS FOR THIS PROJECT IS TAX-DEDUCTIBLE.
WILL YOU HELP DEFRAY ALL OR PART OF THE COST?

The Director will be happy to supply information about the other current development projects both large and small. Telephone 947-2800.

Book Review



SUCCULENTS, A GLOSSARY OF TERMS AND DESCRIPTIONS, R. B. Ivimey-Cook. Published by The National Cactus and Succulent Society (Great Britain), 1975. Spiral bound, 90 pp. plus xviii, 5 figures. 7" x 9⅝". $5.00 postpaid.

A glossary of the specialized words in the field of cacti and leaf succulents is one of the first books you need when you become interested in the subject. It is still necessary when you become an expert collector or grower.

It is a time for celebration, then, when the first new glossary of succulent terms is published in 37 years, more so when the new glossary is as superbly done as this one.

An updating of Marshall and Woods' "Glossary of Succulent Plant Terms", published in 1938 and long out of print, would have been welcome, but Dr. Ivimey-Cook has done more than update his predecessors. Over 3,000 entries, defined with admirable clarity, cover nearly all the terms you are likely to come across in your reading.

We picked, at random, an article in a recent journal that had more than the average number of technical words — names of genera, parts of plants and seeds, chemical components, adjectives referring to shape, color, soil, habitat, growth — and checked them in this new book. Of twenty-four words, twenty-one were there, one not there could easily be figured out from adjacent related words, and one was too obscure to warrant inclusion. That's a very good showing.

What impressed us most was the consistently high quality of Dr. Ivimey-Cook's definitions. The often confused differences between a variety and a subspecies are stated very clearly. Other definitions are equally clear and informative. When the word defined is a genus cactus, to give an example, the definition gives brief data about the shape and habit of the plant, the color of the flowers, the country of origin, and the synonym, if there is one.

Elsewhere in the BULLETIN we have reprinted from this book, with the author's permission, the section on pronunciation. If you have ever hunted for help with this exasperating problem, you will welcome Dr. Ivimey-Cook's short article. Here again clarity and simplicity are outstanding features.

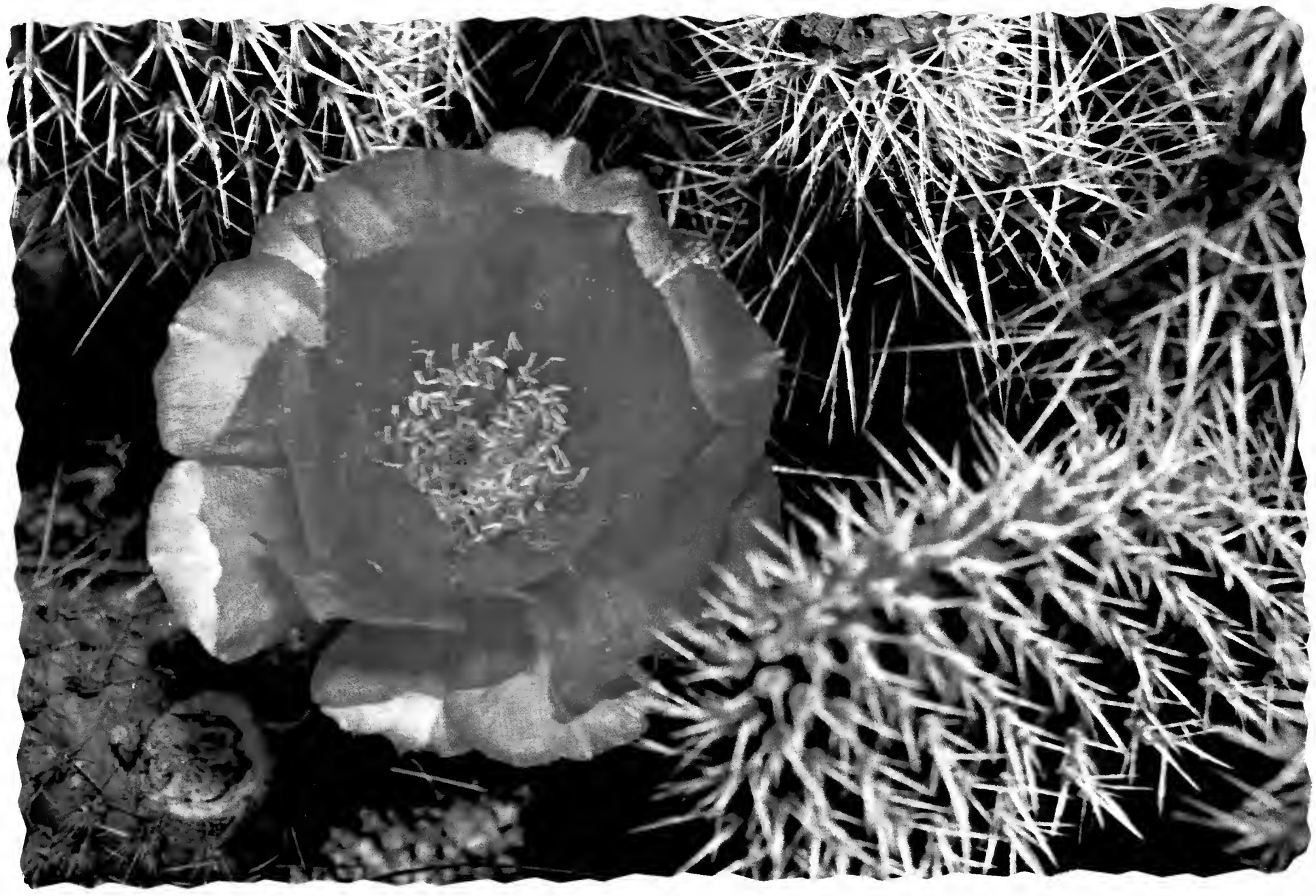
The other sections of the glossary are equally fine. Geographical names, colors, Greek words, nomenclature and name formation are treated briefly and responsibly.

This book has been needed for a long time. Now that it's here, buy it.

(To order direct from England, send $5.00 to H. D. Mann, 21 Windmill Gardens, Kibworth Harcourt, Leicester, England LE8-OLX. Make remittance payable to NCCS.)

—LD

ASPECTS OF OUR GARDEN



Opuntia erinacea is called the Hedgehog Prickly Pear in both English and Latin because at first glance it looks a lot like the Hedgehog Cactus **Echinocereus**. The large flowers are the same bright cerise, and **O. erinacea** pads frequently drop off and root beside the parent plant to give the clumped appearance of an **Echinocereus**.

CHRISTMAS FLOWERING IN THE GARDEN

CROWNBEARD
Verbesina encelioides

ALOE
Aloe sps.

DESERT MARIGOLD
Baileya multiradiata

SACRED DATURA
Datura meteloides

These are only a few of the hundreds of flowers found on the Garden's plants during the Christmas season.

Arizona Cactus

FRAGILE PRICKLY PEAR
Opuntia fragilis
Cactaceae

This little cactus really lives up to its name. Its loosely attached pads have barbed spines that become entangled in the hair of browsing animals who then transport the pads to new areas, often miles away from the original plant. This has resulted in a wide distribution from Arizona to Texas and northward to Ontario on the east, west to Oregon, and north to nearly the Arctic Circle.

O. fragilis is a low growing plant with a maximum height of eight inches and a maximum breadth of 18 inches. The dark blue-green pads are at least half as thick as they are broad and are sometimes so nearly cylindrical when young that they almost resemble chollas. Pads are one-half to two inches long, up to one and a quarter inches broad, and three-eighths to three-quarters of an inch thick.

The infrequent flowers, which are seldom seen in the wild, are quite large for the size of the plant, being two inches in diameter. They are a light yellow and are followed by a small half-inch long yellow fruit that contains large white seeds. Rodents gather the seeds and store them for winter food.

Fragile Prickly Pear is found in Arizona in the pines at 6500 to 7500 ft. elevations. In the central and northern states it is found in the grassy plains, and is a troublesome plant for grazing animals.

It has had five synonyms and many common names, plus the names it is called when it is thoroughly cursed by campers who find the small stems in their ground sheets, blankets and clothing.

Your writer's first contact with any cactus was with this cactus when he was about five years old. On a wildflower-gathering trip with his parents on the prairie west of Winnipeg, Manitoba, the barefoot boy stepped on **Opuntia fragilis**. Little did he realize that this painful initiation foretold renewed contact with cacti forty years later, and that he would

Opuntia fragilis showing the new cylindrical joints and the flattened pads all of which easily detach.

be picking spines out of his hide for many more years.

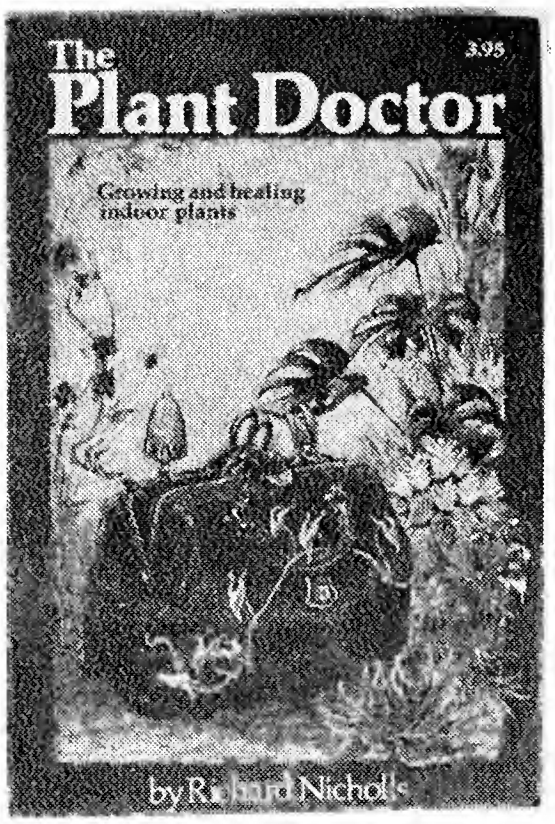
Type Locality: Colorado. "From the Mandans to the mountains, in sterile but moist situations." (Nuttall in General Plants 1: 296, 1818)

Distribution: Mogollon Rim in Arizona to Texas, north to Ontario, Oregon, northwest Canada.

REFERENCES
Benson, Cacti of Arizona
Britton & Rose, Cactaceae
Earle, Cacti of the Southwest

—WHE

Book Review



THE PLANT DOCTOR, by Richard Nicholls. Published by Running Press, 1975. 108 pp., 88 illustrations, paperbound. $3.95 at the Garden's Bookshop, $4.25 postpaid.

An attractive and useful little book for beginners and more experienced owners of indoor plants that will help you "doctor" your ailing plants. It is most helpful when you are in a dilemma about what to use to get rid of certain pests or want to perk up your droopy dieffenbachia.

Described are the three main groups of indoor plants — foliage plants, flowering plants, cacti and succulents — followed by the minor groups that include ferns and gesneriads. An indoor gardener often starts with one group and then in a few years progresses to another, so this book will continue to be helpful.

Several charts in the book will help you diagnose the problems of your "problem plants" in a hurry. One good chapter spells out what types of insects your plants are very likely to attract. Subsequent pages illustrate the insects and advise how they should be controlled.

A "must" chapter tells why and how to treat soils and pots to avoid the common problems. This is a dependable book and makes good reading. —WHE

WANTED: WINTER PEOPLE

Winter is the time when the Garden has more visitors, more phone calls, more office work and more scheduled activities.

Winter is the time when the Garden needs Volunteers.

FROM NOW THROUGH SPRING we need your help

In the Bookstore
In the Office
In the Library
and
In all the many pre-Cactus-Show jobs.

If you can sell, type, file, fill envelopes, write, stick on stamps, print, answer the phone, make a list, add numbers, move boxes, or just be helpful —

Please give the Garden a half-day or a day each week this winter. We'll love you.

Telephone Anne Amacker here at 947-2800.

PRONUNCIATION OF PLANT NAMES

(This brief, clear and charitable treatment of the subject is reprinted with the author's permission from Dr. R. B. Ivimey-Cook's "Succulents, a Glossary of Terms and Descriptions," published by the National Cactus & Succulent Society of Great Britain. Dr. Ivimey-Cook suggests reference to Stearn's "Botanical Latin" for additional information.)

Rather than give the pronunciation for individual words in the text of the Glossary, which would involve pronouncing words which may be fairly common in every-day speech, it seems preferable to treat this topic as a distinct section and to deal particularly with certain terms and also with the Latin names of plants.

It should first be made clear that there is no 'correct' method for the pronunciation of Latin plant-names, and one's principal concern should be to produce an effect which is both pleasing and comprehensible. One has only to attend an International Conference to realise that pronunciation varies greatly from country to country. Nevertheless, there are certain conventions which should be observed and a person who normally speaks English is expected to conform, or at least to recognise his non-conformity.

Pronunciation is determined firstly, by the lengths of the vowels and secondly, by the position of the stress or accent. Vowels may be either short or long, but certain pairs of vowels form diphthongs and have a combined sound which is always long. Words comprise one or more syllables, each syllable consisting of a vowel (or diphthong) and, usually, one or more consonants. In Latin, every syllable must be pronounced, and thus one should say **A-gav-e** and not **A-gave**, **Cot-on-e-as-ter** and not **Cot-on-eas-ter**; the same is true for endings — **oides** is, or should be pronounced **-o-i-des** and not **-oi-des**; similarly the family ending **-aceae** should be pronounced **-ac-e-ae**. It is undoubtedly true, however, that a number of endings are not always pronounced correctly because the result of doing so may be rather unpleasing.

Where words are several syllables long, the accent falls on the penultimate (last but one) if this vowel is long (**for-mōs-us**), or on the antepenultimate (last but two) if the penultimate syllable has a short vowel. If two adjacent vowels do not form a diphthong, the first of these is usually short (**car-ne-a**), though this does not apply to words of Greek origin (**gi-gan-tē-a**).

British botanists and gardeners generally adopt what is known as the 'Traditional English' pronunciation, in contrast to the 'Reformed Academic' pronunciation of classical scholars and also of many Europeans. This involves conventions for the pronunciation of certain letters and diphthongs, the most important of which are summarised in the following table: —

ae	as	**ee** in feet
au	as	**a** in hall
c	is	hard before **a,o,u** and soft before **e,i,y**
ch	as	**k** in keep, or as **ch**
ei	as	**i** in light
g	is	hard before **a, o, u** and soft before **e, i, y**
oe	as	**ee** in feet
ui	is not a diphthong and forms two syllables	

These are only recommendations, but most people adopt some, if not all of them. They can only be applied with difficulty to the names of many genera and species derived

from the names of people and places. Although the International Rules of Botanical Nomenclature require that all such names shall be latinised — i.e. treated as Latin and given a Latin ending, they do not have to be otherwise changed, except that diacritical signs must not appear. Hence the transliteration of some eastern European names can produce what is, to an English-speaking person, a very weird combination of letters (e.g. **Sempervivum dzhavachischvili**). If a knowledge of the language of the original permits some approximatation to the pronunciation in that language, the result is usually reasonably pleasing, but often one is obliged to do the best one can with the letters that are provided.

It has already been implied that these conventions should be adhered to if possible, but there are quite a number of names, as well as some terms, for which more than one pronunciation can be justified. The genus **Cephalocereus** is one such example. The table above implies that both the **c**s should be soft, but the prefix **cephalo-** is derived from the Greek **kephalos**, a head, and the pronunciation 'Kephalocereus' is by no means unknown. Indeed, many people, if they look critically at their own pronunciations, will find that they are not consistent within themselves.

—LD

LITTLE GIFTS

Our Bookshop, always a good place for Christmas shopping, has these pretty and inexpensive new things: silver plated spoons with "gold" saguaros or roadrunners, $1.50; sterling silver bracelet charms, maps, saguaros or roadrunners, $2.25; and solid copper link bracelets, $2.00. So — shop early and shop here!

GARDEN ACTIVITIES

DECEMBER

Tues.	2nd	CACTOMANIACS—Meeting	8:00 P.M.
Wed.	3rd	CLASS—Culture of Desert Trees & Shrubs	2:30 P.M.
Thurs.	4th	ILLUSTRATED LECTURE—Arizona Birds & Animals	3:00 P.M.
Sat.	6th	FIELD TRIP—Castle Hot Springs	8:30 A.M.-4:45 P.M.
Wed.	10th	CLASS—Field Trip: Blue Wash	8:30 A.M.-4:15 P.M.
Thurs.	11th	ILLUSTRATED LECTURE—Mexican Cacti	3:00 P.M.
Thurs.	18th	ILLUSTRATED LECTURE—Western Australian Wildflowers	3:00 P.M.
Thurs.	25th	CHRISTMAS DAY	
Sun.	28th	CENTRAL ARIZ C & SS—Meeting	2:00 P.M.

JANUARY

Thurs.	1st	NEW YEAR'S DAY	
Sat.	3rd	FIELD TRIP—Painted Rock Dam	8:30 A.M.-4:45 P.M.
Tues.	6th	CACTOMANIACS—Meeting	8:00 P.M.
Wed.	7th	CLASS—Deserts . . Their Plants	2:00 P.M.
Thurs.	8th	ILLUSTRATED LECTURE—Arizona Cacti	3:00 P.M.
Wed.	14th	CLASS—Succulent Plants	2:30 P.M.
Thurs.	15th	ILLUSTRATED LECTURE—Arizona Wildflowers	3:00 P.M.
Wed.	21st	CLASS—Culture of Succulent Plants	2:30 P.M.
Thurs.	22nd	ILLUSTRATED LECTURE—Arizona Trees & Shrubs	3:00 P.M.
Sun.	25th	CENTRAL ARIZ C & SS—Meeting	2:00 P.M.
Wed.	28th	CLASS—Identification of Desert Trees & Shrubs	2:30 P.M.
Thurs.	29th	ILLUSTRATED LECTURE—Arizona Birds & Animals	3:00 P.M.